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MEDICAL INVESTIGATIONS

— IN —

LIFE INSURANCE;

BEING A SERIES OF

SPECIAL REPORTS

TO THE

BOARD OF DIRECTORS

OF THE

UNITED STATES LIFE INSURANCE
COMPANY,

261 BROADWAY,

— BY —

THE MEDICAL STAFF OF THE COMPANY.



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1880



ANNUAL REPORT
OF THE
MEDICAL EXAMINER
OF THE
UNITED STATES LIFE INSURANCE CO.
IN THE CITY OF NEW YORK.
TO THE BOARD OF DIRECTORS,
For the year ending Dec. 31, 1873.

Gentlemen :

At the request of your President, I have instituted a careful inquiry into the death-record of this company from its incorporation in 1850 to the present time—December 27th, 1873. Such an inquiry, it was believed, would, on the one hand, throw light on at least some of the errors of the past and so enable us to avoid them in the future, while on the other, it would more clearly define the rules regarding health, personal habits and family history in accordance with which a financial success in

assuring lives had already been attained. Many of our agents, too, were disposed to consider the rulings of the home office unnecessarily severe, and it therefore seemed very desirable, if possible, to show in the past experience of the company a justification for the course followed.

As a preliminary step to such a study it was found necessary to gather together into a single volume, in systematic order, all the facts contained in the applications, the Medical Examiner's reports and the "proofs of death," of those who had died during this period. This part of the work has been done in a very satisfactory manner by Mr. J. A. Marsh of this city, and is submitted herewith for your inspection.

The number of deaths involved in this inquiry is one thousand. The causes by which they were encompassed are set forth in the following table :

TABLE I.

	No. of Cases.
Abscess (of arm, parotid gland, and perineum)	3
Anæmia	2
Aneurism	4
Apoplexy	53
Assassination	4
Asthma	2
Bladder, inflammation of	3
Brain, acute disease of	36
Brain, chronic disease of	32
Bronchitis	7
Bowels, inflammation of	24
Calculus (biliary and cystic)	2
Cancer	22

	No. of Cases.
Casualties (war, shipwreck, poison and drowning)	54
Cerebro-spinal meningitis	7
Cholera, Asiatic	17
Cholera morbus	9
Consumption	268
Delirium tremens	10
Diabetes	7
Diarrhoea	9
Diphtheria	5
Dropsy	20
Dysentery	27
Epilepsy	2
Erysipelas	10
Exhaustion, from undue mental labor	1
Fever, continuous	60
Fever, intermittent and remittent	8
Fever, congestive	10
Fever, yellow	1
Gastritis	9
Heart, diseases of	49
Hemorrhage, internal from strain	2
Hernia, strangulated	4
Hydrothorax	2
Intemperance (forms of disease not stated)	6
Kidneys, chronic disease of	25
Lead disease	1
Liver, abscess of	4
Liver, cirrhosis of	5
Liver, cancer of	2
Liver, diseases of (forms not stated)	27
Lungs, abscess of, from embolism	1
Malignant pustule	2

	No. of Cases.
Parturition	2
Peritonitis	4
Pleurisy	2
Pneumonia	81
Puerperal fever	1
Purpura hemorrhagica	1
Rheumatism, acute articular	7
Scarlatina	1
Small-pox	9
Stomach, ulcer of, with hemorrhage	3
Suicide	19
Sunstroke	2
Unknown (found dead, etc.)	10
	<hr/> 1,000

It will thus be seen that the most fatal element in our list of diseases is consumption, which alone has been productive of nearly 27 per cent. of the deaths. The zymotic diseases—intermittent, remittent, scarlet, typhoid and yellow fevers, small-pox, diphtheria, erysipelas, cerebro-spinal meningitis, cholera, dysentery and diarrhœa—constitute the second largest group, including 198 cases, or nearly 20 per cent.

Next in order come the various diseases of the brain, such as apoplexy, congestion, inflammation and softening of the brain, acute mania, epilepsy and sunstroke. This group numbers 125 cases, or nearly 13 per cent. of the entire mortality. If we add to it the cases of suicide and delirium tremens, the group will number 155 cases, or over 15 per cent.

The acute diseases of the lungs—pneumonia, bronchitis and

pleurisy—constitute the fourth largest group, containing 90 cases or 9 per cent.

Finally, the diseases of the heart and larger blood vessels comprise 53 cases or 5 per cent.

TABLE II.—RELATIONS OF HEIGHT TO WEIGHT.

(Based upon 1639 American Lives.)

HEIGHT.		No. of Indiv. Involved.	Aggregate Weight lbs.	Average Weight. lbs.	Average Weight (Hutchinson.) lbs.	Average Weight. (A. Standard.) lbs.
4 ft.	9 in.	1	121	...	...	...
4 ft.	10 in.	..	...	...	...	...
4 ft.	11 in.	2	235	117	..	...
5 ft.		8	1025	128	...	...
5 ft.	1 in.	6	738	123	120	120
5 ft.	2 in.	14	1770	126	126	125
5 ft.	3 in.	33	4268	129	133	130
5 ft.	4 in.	78	10374	133	139	135
5 ft.	5 in.	91	12452	136	142	140
5 ft.	6 in.	179	25261	141	145	143
5 ft.	7 in.	257	37694	146	148	145
5 ft.	8 in.	334	50678	151	155	148
5 ft.	9 in.	197	30750	156	162	155
5 ft.	10 in.	224	35482	158	169	160
5 ft.	11 in.	102	16913	165	174	165
6 ft.		81	14008	172	178	170
6 ft.	1 in.	20	3462	173	...	...
6 ft.	2 in.	9	1508	167	..	...
6 ft.	3 in.	3	630	210	...	...

Before entering into the particulars of these five groups, allow me to lay before you some statistics collected in the course of the present inquiry. It was found, for instance, that out of the thousand individuals, whose policies had matured by death, the heights and weights of 742 had been recorded by the medical examiner. As this number did not appear to me to constitute a sufficiently large basis upon which to found a table, I collected from the volumes of the medical examiner's reports the heights and weights of 897 other individuals (all males and all accepted risks), thus making a total of 1639 males whose average age was nearly 37 years.

The table of average heights and weights now in use among all life companies in the United States, is, I believe, a modification of Dr. Hutchinson's table. The correctness of the modified table for American purposes is fully confirmed by the results of the present investigation, as set forth in the preceding table.

GROUP I.

DISEASES OF THE HEART AND LARGER BLOOD-VESSELS.

In stating that there were but 53 cases in this group, I am confident that the number falls short of, rather than exceeds, the truth.

Of the two cases of asthma, 2 cases of hydrothorax, 20 cases of dropsy, 25 cases of chronic disease of the kidneys and 27 cases of the liver, it is highly probable that quite a number were

secondary to disease of the heart. The facts stated in the death-certificates are not, however, sufficiently explicit for me to venture upon any more accurate diagnoses than those given in Table I.

The average age at death of the entire group is 49 years, distributed among the different periods of life as follows :

TABLE III.—DISEASES OF THE HEART AND LARGER BLOOD-VESSELS.

	20	25	30	35	40	45	50	55	60	65	70
Ages.....	to	to	to	to	to	to	to	to	to	to	to
	24	29	34	39	44	49	54	59	64	69	74
No. of cases.....	1	2	3	5	7	5	8	14	5	2	1

It will thus be seen that this form of disease is pre-eminently one of mature age, 56 per cent. of the deaths having occurred during or after the 50th year of life and nearly 80 per cent. after the 40th. Another feature of some practical importance is the fact that out of the 49 cases (excluding the 4 cases of aneurism), 15 gave a previous history of "rheumatism." None of these cases made any complaint of palpitation of the heart, shortness of breath or any other suspicious symptom at the time they were insured, and it is to be presumed that no physical signs were at that time discoverable which might have thrown light upon the causes of their subsequent deaths. Hence the only indication of the disease of which they were eventually to die, lay in the circumstance of their having had "rheumatism."

The fact, then, that 30 per cent. of all our losses through disease of the heart were known, at the time of issuing the policies, to have had rheumatism, would suggest the propriety of making an inquiry into the history of our rheumatic risks, similar to that which has been made farther on in the case of those having a consumptive element in their family histories. This investigation, however, must be reserved till some future time.

The ages at death of the four cases of aneurism average 50 years.

GROUP II.

ACUTE DISEASES OF THE LUNGS.

There is very little to say concerning the diseases of this group, except that they carry off some of our healthiest risks in the very prime of life.

I know of no way of guarding against loss from this source unless it be by the exercise of caution in accepting persons whose occupation exposes them to sudden and great changes in temperature. Tables IV. and V. will show the seasons of the year when the disease is most prevalent, and the ages at which it is most likely to occur.

TABLE IV.—ACUTE DISEASES OF THE LUNGS.

Prevalence according to seasons.

Month	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
No. of cases.....	13	15	9	10	7	7	4	3	2	2	10

TABLE V.—ACUTE DISEASES OF THE LUNGS.

Ages at Death.

Ages.....	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	to	to	to		to	to	to	to	to	to	to	to	to	to	to	to
	19	24	29	34	39	44	49	54	59	64	69	74	79	84	89	94
No. of cases.....	1	2	7	10	17	13	14	11	4	9	0	0	1	0	0	1

GROUP III.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM: DELIRIUM TREMENS AND SUICIDE.

Year.	Congestion of Brain.	Apoplexy.	Softening.	Inflammation of brain.	Chronic disease of brain.	Insanity.	Acute Mania.	Nervous pros- tration from overwork.	Epilepsy.	Cancer of brain.	Abscess of brain.	Suicide.	Del. Tremens.	Totals.
1850.....	1													1
1851.....														0
1852.....	1	1		1										3
1853.....			1										1	2
1854.....	1											1		2
1855.....	1	1		2	2		1		1					8
1856.....													1	1
1857.....		1										1		2
1858.....	1	1											1	3
1859.....	1									1				2

[illegible]

There are several questions of interest which arise during the study of this group of diseases, but unfortunately the number of cases which it comprises is comparatively small and the details of the individual histories are in many instances incomplete. Nevertheless the results are suggestive of certain inquiries that might profitably be made, were the material at one's command larger.

The relative frequency of the different diseases and their distribution among the different years of the past are set forth in the preceding table.

Leaving out the cases of suicide, and separating the ages into periods of five years each, I find the apoplexies, congestions, softenings, etc., of the brain to have been distributed as follows :

TABLE VII.—DISEASES OF BRAIN AND NERVOUS SYSTEM.

Ages at Death.

Ages.	20	25	30	35	40	45	50	55	60	65	70	75
	to	to	to	to	to	to	to	to	to	to	to	to
	24	29	34	39	44	49	54	59	64	69	74	79
No. of cases.	2	6	9	19	26	22	22	14	12	2	2	1

The height and the weight were recorded in 116 out of the 156 cases. They are as follows :

TABLE VIII.—DISEASES OF BRAIN AND NERVOUS SYSTEM.

Relations of Height to Weight (116 cases.)

Height	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6 ft	6.1
Weight	127	—	132	137	144	159	157	157	166	160	172	181	145
Amer. standard	120	—	130	135	140	143	145	148	155	160	165	170	—

As to the question of whether the disease was or was not in some instances hereditary, I would reply that in 10 cases the father was known to the company, at the time the policy was issued, to have died of apoplexy or softening of the brain, by suicide or by intemperance ; that in 4 other cases the mother was known to have died of suspected brain trouble ; that in four others still a parent, together with a brother or sister, were known to have died from the same causes ; while finally, in six other cases, one or more brothers or sisters were known to have been victims of brain trouble. Thus it is possible that in a little over 15 per cent. of all these cases there was an hereditary taint predisposing the applicants to the diseases of which they eventually died.

In 18, or a little over 11 per cent. of the cases, the family history was tainted with consumption. In 22, or 14 per cent. of the cases, the applicants had been at some previous time afflicted with "rheumatism."

The suicides are grouped in the following manner, according to their ages and methods of destroying life :

TABLE IX.—SUICIDES.

Ages at Death.

Ages.....	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
No. of cases.....	1	2	4	2	4	4	1	1

TABLE X.—SUICIDES.

Modes of Death.

Modes of Death.....	Jumping out of Window.	Drowning.	Stabbing.	Strychnine.	Cutting throat.	Shooting.	Hanging.	Not stated.
No. of cases.....	1	2	1	2	2	3	4	4

GROUP IV.

ZYMOTIC DISEASES: TYPHOID FEVER, SCARLET FEVER, YELLOW FEVER, INTERMITTENT AND REMITTENT FEVERS, CEREBRO-SPINAL MENINGITIS, CHOLERA, ERYSIPELAS, PUERPERAL FEVER, DIPHTHERIA, SMALL-POX, DIARRHŒA, AND DYSENTERY.

The recent epidemic of yellow fever in some of the South-western cities has been seriously felt by some of our neighbors, but as our own company has never issued policies on persons

residing in the Southern States, except in isolated cases, it is not surprising that there should have been only one death from that disease. The epidemic referred to, however, would probably not have proved so fatal to the better classes, had not the cities in which the disease prevailed been in such a deplorable sanitary condition. In the future it would perhaps be to the Company's interest to note the sanitary condition of the towns and cities in which risks are to be taken, and avoid all places where sanitary laws are persistently disregarded.

In regard to the continuous fevers, such as typhus and typhoid, a glance at Table XI. will show that among our policy-holders no period of life has been specially liable to these diseases.

TABLE XI.—CONTINUOUS FEVERS.

Ages at Death.

Ages.....	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69
No. of cases.	2	8	5	8	8	9	6	4	7	2	1

The only provision that can be made by the Company to avoid an excessive mortality from this source is by not issuing policies, at least on the life plan, to men whose pecuniary circumstances compel them to live in the crowded tenement houses of our larger cities.

GROUP V.

CONSUMPTION.

Our “proofs of death” are not sufficiently accurate to enable me to make a distinction between tubercular disease of the lungs and chronic bronchitis,—a form of disease so nearly like the tubercular variety in all its outward manifestations that I scarcely believe it will ever be possible in insurance statistics to call it by any other name than consumption. For practical purposes, however, it is not necessary to make such a distinction.

Consumption has at all times in the history of the Company been the cause of a large percentage of its losses, no less than 268, or nearly 27 per cent., of the entire number of deaths having been due to this disease. The yearly losses from this source are as follows :

TABLE XII.—CONSUMPTION.

Number of deaths according to years.

Year.	Total Number Deaths.	Deaths by Consumption.	Percentage.
1850	3	..	..
1851	5	..	..
1852	38	..	..
1853	24	6	25
1854	25	7	28
1855	29	5	17 1-4
1856	16	7	43 3-4
1857	25	6	24
1858	25	10	40
1859	18	11	61 19
1860	23	7	30 1-2
1861	22	5	22 2-5
1862	33	11	33 1-3
1863	28	12	43
1864	33	10	30 1-3
1865	53	13	24 1-2
1866	57	14	24 1 2
1867	53	15	28 1-3
1868	62	16	25 5-6
1869	82	23	28 1-20
1870	70	27	38 4-7
1871	92	28	30 4-9
1872	93	13	14 1-8
1873	91	22	24 1-5
24 Years.	1000	268	27 per cent.

The first thing here that attracts our attention is the fact that while the mortality from consumption in the country at large is

generally considered to be only 15 per cent. of the entire mortality, in the community of policy-holders, all selected lives, it is nearly twice as great.

The unfairness, however, of this comparison will appear at once if we take into account the fact that the community of policy-holders differs from the population at large in having among its number no individuals under 18 or 20 years of age and very few over 65. Hence from the total number of deaths for 1870, as ascertained by the last census, and from the 1000 deaths in the Company's experience, we should deduct all those which occurred before the 20th or after the 64th year of life. The same should be done in the case of the deaths from consumption. Placing the results together in the form of a table, we have the following :—

TABLE XIII.

	Total deaths from all causes. 20 to 65 years.	Deaths from Con- sumption. 20 to 65 years.	Ratio.
Community at Large.	100,472	24,978	25 per cent.
Company's Experience.	969	263	27 per cent.

In other words, the Company's mortality from consumption is but little greater than that which prevails in the community

at large. But I am told by the Actuary that a still further deduction—one, however, that is hardly susceptible of being computed in numbers—should be made on account of the withdrawal every year of a large number of healthy lives from the community of the insured, while those who remain comprise among their number an undue proportion of diseased or weak lives. In a community thus peculiarly constituted we should certainly expect a proportionately heavier mortality from consumption than among the population at large.

Making due allowance for this, and bearing in mind the eagerness of phthisical persons to insure their lives, and the difficulty of diagnosticating the disease in its early stages, especially when the applicant withholds important facts from the examiner's knowledge, I am rather surprised that the comparison should result so favorably for the company.

TABLE XIV.—CONSUMPTION.

Ages at Death.

DEGREE OF HEREDITARY TAIN'T.	No. of Cases.	Average Age at Death.	Average Age of Parents at Death.	Average Age of Brothers and Sisters at Death.
Hereditary by mother and father, and one or more brothers or sisters.....	2	51 1-2	48 1-4	..
Hereditary by the mother and father.....	1	48	61	..
Hereditary by the mother.....	18	39	43 1-6	..
Hereditary by the father.....	13	38	36	..
Hereditary by the mother and one or more brothers or sisters.....	10	45 1-2	56 1-2	26
Hereditary by the father and one or more brothers and sisters.....	2	39	51	40
Hereditary by one or more brothers or sisters.	30	41	..	31
Totals.....	76	41	45	30

I would call attention in this place to the fact that the mortality from consumption, among our outside risks, has been decidedly heavier in proportion to the total number of lives at risk than that which has occurred in this city and vicinity.

Before discussing this question further, let us glance at some of the facts that may be gathered from a closer study of these 268 deaths (see p. 16).

In the first place, we find that the average age at which they insured their lives is 34 years, whereas the average age at which the remaining 732 became insured is $38\frac{1}{2}$ years. The average age at death of the 268 is 39 years, while among the other 732 it is 44 years. In 76 cases (29 per cent.) there seems to have been a consumptive taint in the family. These cases are classified in the preceding table.

It is a fact well known to the officers of insurance companies that the terms "childbirth," "change of life," "exposure," "grief," "fever," "inflammation of the lungs," and "general debility," used by the applicant to designate the cause of death of some member of the family, are in many instances synonymous with consumption. This is particularly true of the applications for insurance that come from agents in the country. Physicians who make but half-a-dozen examinations in a year are slow to learn the importance of a thoroughly sifted family history. I believe it is no exaggeration to say that about half of these cases would prove, upon careful inquiry, to have been genuine cases of consumption. With this in view I have constructed the following table, which shows that in an additional 24 per cent. of the deaths there was a doubtful family record.

TABLE XV. —DEATHS FROM CONSUMPTION AMONG THOSE WITH A
DOUBTFUL* FAMILY HISTORY.

Ages at Death.

DEGREE OF DOUBTFUL TAINT.	No. of Cases.	Average Age at Death.	Average Age of Parents at Death.	Average Age of Brothers and Sisters at Death.
Hereditary by the mother.....	34	39	43	..
Hereditary by the father.....	14	42	49	..
Hereditary by one or more brothers or sisters.	17	44	..	27
Totals.....	65	41	44 3-5	27

* The causes of death, as stated, being "childbirth," "change of life," "fever," &c.

It will, therefore, not be far from the truth to say that in about 40 per cent. of our consumptive losses, the taint in the family history played an important part in determining the eventual cause of death. Further on I will revert to this question and follow it out more closely.

The ages at which these 268 consumptives died are arranged in periods of five years each in the following table :—

TABLE XVI. — CONSUMPTION.

Ages at Death.

	15	20	25	30	35	40	45	50	55	60	65	70	75
Ages.	to	to	to	to	to	to	to	to	to	to	to	to	
	19	24	29	34	39	44	49	54	59	64	69	74	
No. of Cases.	3	9	22	55	62	43	36	21	9	4	2	1	1

From this table it will be seen that 60 per cent. of the deaths occurred between the ages of 30 and 45, or 73 per cent. between the ages of 30 and 50.

Our only way of judging of the physical condition of the 268 individuals at the time they were insured, is by ascertaining their average heights and weights at that time. On investigation, however, I find that the heights and weights as ascertained at the time the policies were issued, have been recorded in only 209 instances. In these cases the average weights for the different heights are as follows :—

TABLE XVII.—CONSUMPTION.

Relations of Height to Weight. 209 cases.

Height. . .	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6ft.	6.1	6.2	6.3
Weight. . .	116	...	112	128	133	134	141	143	148	148	148	145	161	160	185
Am. Stand.	120	...	130	135	140	143	145	148	155	160	165	170	...	...	...

As it is not likely that the weights of the remaining 59 cases would materially disturb the average here given, I believe we can safely assume that these results represent correctly the average heights and weights of the entire group. Here, then, we find a second important general characteristic of these consumptive cases—a tendency to leanness, especially noticeable among the tall individuals of the group. This diminution in weight is even more marked than is the increase among the group of diseases of the brain and nervous system. Until we shall have reversed the investigation and ascertained what has been the mortality

among all, or at least a large number, of our lean risks, it would not be safe to lay down any general rule regarding them. It is evident, though, that this class of risks must be accepted with caution.

An investigation into the physical histories of the group prior to insurance, reveals only two points of interest : 7 per cent. of the number had been more or less subject to “rheumatism,” and 5 per cent. had previously had “spitting of blood.”

So far then as we have gone in this inquiry, the results obtained would seem to indicate the necessity for separate inquiries in regard to the mortality among :—

1. Those who have had “spitting of blood,” and those who have had a consumptive taint in their family histories ;
2. Those who have been over or under the standard weight ; and
3. Those who have had “rheumatism.”

The last two of these inquiries will have to be postponed till some future time, but the results of the first are submitted below.

AN INQUIRY INTO THE MORTALITY OF 800 POLICY-HOLDERS, WHO
WERE SUPPOSED, AT THE TIME THE POLICIES WERE ISSUED,
TO HAVE A PRE-DISPOSITION TO CONSUMPTION,
EITHER INHERITED OR ACQUIRED.

The 800 cases, upon which the following calculations are based, represent very nearly the total number of risks of this

kind which the Company has upon its books for the city of New York and vicinity, prior to 1872. About 700 of the number were examined by the former medical director of the Company, Dr. Clements, and the balance by the physicians mentioned in the early part of this report and by myself. To facilitate the arrangement into groups or classes, all the facts of importance, either in an actuarial or a medical point of view, were written upon a separate card for each case. The groups into which the entire number were divided are the following :

1. Those who had previously had spitting of blood, 70 cases.
2. Those who had previously lost a parent from consumption, 386 cases.
3. Those who had previously lost one or more brothers or sisters, 229 cases.
4. Those who had previously lost a parent and one or more brothers or sisters from consumption, 107 cases.
5. Those who had previously lost both parents from consumption, 8 cases.

GROUP I.

SPLITTING OF BLOOD.

The facts relating to this group are briefly the following : In the first place, if the proportion of height to weight is any indication of a good physique, the 53 cases in which these items have been recorded, must have been well selected. The averages are as follows :

TABLE XVIII.—SPITTING OF BLOOD.

Relations of Height to Weight. 53 cases.

Height...	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6.00
Weight.....	125	...	...	159	...	141	139	151	159	155	173	160
American Standard...	120	...	...	135	...	143	145	148	155	165	165	170

In the second place, I find that in only two cases had the insured had spitting of blood more than once. In eight instances no record seems to have been kept of the time that had elapsed since the last attack. In the remaining 62 cases the lengths of time were recorded, and may be classified as follows :

TABLE XIX.—SPITTING OF BLOOD.

Length of time since the occurrence.

LENGTH OF TIME.	1 year.	2 years.	2-5 years.	5-10 years.	10-15 years.	15-20 years.	20-25 years.	25-30 years.	30-40 years.	Not stated.	Sev'ral times.
A.—No. of Cases.....	2	2	4	19	10	5	6	2	1	6	2
B.—No. of Cases.....	1	1	...	3	4	...	...	...	...	2	...
Total No. of Cases...	3	3	4	22	14	5	6	2	1	8	2

A. Those whose policies have not become claims.

B. The deaths.

Fifty-nine of the cases were apparently free from any hereditary taint that might complicate the problem. The deaths in the entire group were 11 in number ; one from dysentery, one from softening of the brain, one from intemperance, and eight from consumption (nearly 73 per cent.). There were 8 deaths among the 59 non-hereditary cases, or 1 to $7\frac{3}{8}$ persons ; while among the 11 cases, complicated by an hereditary taint, there were 3 deaths, or 1 to $3\frac{2}{3}$ persons. The average age at which the 70 were insured is $36\frac{1}{2}$ years ; the average age of the eleven at death is $43\frac{3}{4}$ years.

GROUP II.

ONE PARENT CONSUMPTIVE.

The average age at which these 386 cases were insured is 33 years, while the average age at which the parents died of consumption is 42 years. Or, if we make two subordinate groups, one of 161 cases in which the consumptive taint came through the father, and the other of 225 cases in which it came through the mother, we shall find that in both groups the applicants averaged 33 years of age, but that in the former the fathers averaged 45 years at death, while in the latter the mothers averaged only 40 years.

Again, the relations of height to weight, in 320 individuals of the group, are as follows :

TABLE XX.—ONE PARENT CONSUMPTIVE.

Relations of Height to Weight. 320 cases.

Height.....	4.11	5.00	5.1	5.2	5.3	5.4	5.5	5.6
Average Weight.....	117	109	115	107	117	130	134	134
American Standard.....	...	...	120	125	130	135	140	143
Height.....	5.7	5.8	5.9	5.10	5.11	6.00	6.1	6.2
Average Weight.....	141	152	155	154	171	158	170	173
American Standard.....	145	148	155	160	165	170	...	...

The deaths in this group were 22 in number ; 8 from consumption (36 1-2 per cent.), 6 from brain troubles (27 1-3 per cent.), one from inflammation of the bowels, one from cancer of the face, one from cancer of the bowels, one from abscess of the liver, one from dysentery, one from typhoid fever, one from fatty degeneration of the heart, and one from congestive malarial fever. Or, making the same division as before into two subordinate groups, we obtain the following results :

Hereditary by the mother, 225 policies. 15 deaths.
 Hereditary by the father, 161 policies. 7 deaths.

GROUP III.

ONE OR MORE BROTHERS OR SISTERS CONSUMPTIVE.

This group comprises 229 cases. The average age of the applicants at the time they became insured is 36 years ; the average age of 285 brothers and sisters, alleged by them to have died of consumption, is 36 years. The relations of height to weight are as follows :

TABLE XXI.—ONE OR MORE BROTHERS OR SISTERS CONSUMPTIVE.

Relations of Height to Weight. 181 cases.

Height.....	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6.00	6.1	6.2
Average Weight...	130	150	132	134	145	143	148	147	155	161	173	156	190
American Standard	125	130	135	140	143	145	148	155	160	165	170	...	...

The deaths in this group are 12 in number ; namely, 4 from consumption ($33\frac{1}{3}$ per cent.), 3 from disease of the brain (25 per cent.), 2 from accidental causes, 1 from "dropsy," 1 from chronic inflammation of the bladder, and 1 from cirrhosis of the liver.

GROUP IV.

A PARENT AND ONE OR MORE BROTHERS OR SISTERS CONSUMPTIVE.

The 107 applicants of this group were 35 years of age, on an average, at the time their policies were issued by the company. The average age at which the parents died is 47 years. The relative heights and weights are as follows :

TABLE XXII.—ONE PARENT AND ONE OR MORE CHILDREN CONSUMPTIVE.

Relations of Height to Weight. 85 cases.

Height.....	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6.00	6.1	6.2
Average Weight...	119	125	131	140	141	146	159	153	167	160	191	..	181
American Standard	125	130	135	140	143	145	148	155	160	165	170	...	...

The deaths which occurred in this group are 15 in number, 10 among the 67 who received the consumptive taint through the mother, and 5 among the 40 who received it through the father. The causes of death are the following :

Six, or 40 per cent., died from consumption ; three, or 20 per cent., died from brain troubles ; two from typhoid fever ; one from Bright's disease of the kidneys ; one from abscess of the liver ; one from accidental, and one from unknown causes.

GROUP V.

BOTH PARENTS CONSUMPTIVE.

The eight applicants of this group were, on an average, 35 years of age at the time they were insured, while their parents at death averaged 52 years of age. They were all of good proportionate weight. The only death that occurred in the group was due to consumption.

CONCLUSIONS.

Thus far I have simply endeavored to present, in a condensed form, as many of the facts as I was able to gather concerning the physical condition, family history and death-record of the 800 individuals involved in the present inquiry. The great practical question, however, is : Has it paid to insure these more or less imperfect lives ? If it has not, why should we continue to lose money on this class of cases ; if it has, then it will be well worth our while to define the conditions, or laws in accordance with which success has been obtained ; and this our analysis will, to a certain extent, enable us to do.

Through the kindness of the Actuary, Mr. William D. Whiting, I am enabled to furnish you with the answer to this most

important question. It is embodied in the following communication :

December 23, 1872.

ALBERT H. BUCK, M.D. :

Sir—I have carefully examined the cards, containing the names of parties insured in this company, whose family history, as taken from the applications, shows a taint of consumption, handed me by yourself. I have eliminated therefrom all duplicate risks, when more than one policy has been issued upon the same life, thereby increasing the reliability of the results notwithstanding the smaller basis for calculation obtained.

The results, grouped as requested, are as follows, compared with the expected mortality according to the actuaries' or 17 office experience tables.

TABLE I.

	No. of Pals.	Exposure.	Table Mort.	Actual Mort	Ratio of actual to expected Mortality.
One Parent	386	2864 $\frac{1}{4}$	35.52	22	61.93
One or more Brothers and Sisters. . .	229	1807 $\frac{3}{4}$	21.82	12	55.00
One Parent and one or more Brothers and Sisters.....	107	768 $\frac{1}{2}$	9.35	15	160.42
Both Parents.....	8	63	.75	1	133.33
Insured spat blood	70	495 $\frac{1}{2}$	6.16	11	178.57
Totals.....	800	5999	73.60	61	82.88

In order to show the relative mortality, where there is but one member of the family dying by consumption, and where there is more than one member, free from the confusion of minuter classifications, I have arranged the same risks in the following order :

TABLE II.

	No. of Pals.	Exposure.	Table Mort.	Actual Mort.	Ratio of actual to expected mortality.
One person in family	553	4075 $\frac{1}{4}$	40.89	33	66.14
More than one person in family	177	1428 $\frac{1}{4}$	17.55	17	96.86
Insured spat blood	70	495 $\frac{1}{2}$	6.16	11	178.57
Totals	800	5999	73.60	61	82.88

No one of these “spitting blood” is included in any other group, as these cases were selected for the purpose of showing this important item separately, without regard to family history. The enormous mortality shown, I believe for the first time, will of itself fully justify the extra labor.

I have also made a subdivision of the 1st and 3d groups for the purpose of elucidating the relative mortality when the father was the party dying of consumption as contradistinguished from the mother dying of the same disease, as suggested by you. The results, as *a priori* expected, are as follows :

TABLE III.

	No. of Pals.	Exposure.	Table Mort.	Actual Mort.	Ratio to Table.
Father died of consumption.....	161	1220	14.86	7	47.11
Mother “ “ 	225	1644 $\frac{1}{4}$	20.66	15	72.60
Father and one or more Brothers and Sisters.....	40	326	3.74	5	133.69
Mother and one or more Brothers and Sisters.....	67	442 $\frac{1}{2}$	5.61	10	178.24

Or, consolidating the same without regard to brothers and sisters into only two groups, we have : —

TABLE IV.

	No. of Pals.	Exposure.	Table Mort.	Actual Mort.	Ratio to Table.
Father dying with consumption.....	201	1546	18.60	12	64.51
Mother “ “ 	292	2086 $\frac{1}{4}$	26.27	25	95.16

In conclusion, I would say that the most valuable results of the above, in a mathematical point of view, are those in tables II. and IV., on account of the number of policies involved securing greater uniformity in the law of averages. For the same reason groups Nos. 4 and 5 of Table I. should be taken with much caution, especially group 4, consisting of but 8 persons, and having no value except to show that *as far as it*

goes it is in the direction which would be surmised *a priori*. I am very much pleased to find that, taking these risks as a whole, the mortality has been very favorable to the company.

Yours truly,

WM. D. WHITING,
Actuary.

From these calculations, therefore, it would seem that the excessive mortality of three of the groups (spitting of blood, both parents, and one parent together with one or more children), comprising 185 cases, is more than counterbalanced by the small mortality of the other two, which comprise in all 615 cases. It would perhaps be rash to draw the inference that hereafter cases, belonging to the three groups in which the mortality has proved excessive, should not be admitted to the privileges of life insurance, but we can scarcely go amiss in rejecting hereafter all cases of "spitting of blood," no matter how long the time that may have elapsed since the occurrence of this symptom. As to the group of two consumptive parents, if we hereafter admit cases belonging to it, the applicants should be not less than 45 years of age.

In the group of one consumptive parent together with one or more consumptive brothers or sisters, the average age of the applicants is 35 years, which would imply that a fair proportion of the number were still younger; in point of fact 60 of this group were 30 years of age or younger. It would probably not be too severe a rule to accept applicants of this class only on condition that they have attained their 35th year, and that the

consumptive brothers or sisters had died at a still earlier age. Otherwise the risk should be postponed until he shall have attained the age at which the brothers or sisters died of consumption. In doubtful cases some weight may be attached to the fact that the mortality is greater among those who receive the consumptive taint through the mother than among those who receive it through the father.

We cannot wonder at the low mortality in the group of one or more consumptive brothers or sisters, when we observe what care has been taken to insure only those who had passed, or at least attained the ages of their deceased brothers or sisters.

As regards the group of a single consumptive parent, the results attained are so astonishingly favorable that I am afraid to recommend a course in harmony with the logical deductions one would naturally make. Until these results have been corroborated by future investigations, it would appear wiser to follow the rule that, where one parent has died of consumption, the applicant should be at least 30 years of age.

As regards the physical condition of those applying for insurance, our statistics justify us only in speaking of the relations of height to weight. (It is, of course, taken for granted that we are dealing only with individuals who in all other respects are healthy.) In cases, therefore, where the hereditary taint alone seems scarcely a sufficient reason for declining the risk, the fact of his being below the standard weight should render us cautious in recommending him.

Respectfully submitted by

ALBERT H. BUCK, M.D.

ANNUAL REPORT
OF THE
MEDICAL EXAMINER
OF THE
UNITED STATES LIFE INSURANCE CO.

For the year ending Dec. 31, 1874.

January, 1875.

JOHN E. DEWITT, *President* :

Sir—In the last annual report of the Medical Director, allusion was made to the subject of Rheumatism, and some few general observations with regard to it were made at that time, with a promise of a fuller and more complete inquiry at some future period.

During the past year the subject has been taken up, and as careful an investigation made as it was possible to make with the dates and information at our command.

The result of this investigation is given below, and while it does not furnish sufficient grounds for the adoption of any fixed rules with regard to the acceptance or rejection of rheumatic risks, yet it confirms, so far as it goes, the impressions of medical men in relation to the effect of rheumatism, and will serve to make the Medical Examiners of this company at least, extremely careful in the selection of risks which have any history of rheumatism.

It is to be regretted that the applications heretofore used (and in this respect all companies were alike) were such that the particulars necessary to a *full* understanding of rheumatic attacks in applicants, could be obtained in but comparatively few cases, and it is owing to this, that we are unable to show, as we wished to do, the effect of rheumatism at the different periods of life, because the dates at which the individuals suffered the attacks are rarely mentioned, nor is even the character of the disease specified in the great majority of instances ; still, with all this against us, we have been enabled to present some facts which are, to say the least, suggestive. We are glad to say that in the new application recently adopted by the Chamber of Life Insurance, these defects of the old forms are remedied, and hereafter we shall be able to command far greater accuracy of detail.

Our investigations have been made on 844 cases, who report in their applications that they have suffered from rheumatism at some time in their past lives. This includes all grades of rheumatism, from "slight muscular" up to "acute inflam-

matory." Many of these cases have, of course, lapsed ; so that as a whole, we can follow the 844 but a little way from the threshold ; and owing to this fact, our observation has extended to but $7\frac{1}{5}$ years' average to each individual. Therefore, we can only say of them, as a whole, that they came from all classes of the people,—were engaged in the various pursuits of life,—and were of all ages upon which policies are usually written.

Of these 844 we have the height and weight in 674 instances, but in the remaining 170 these records are wanting. It is scarcely probable, however, that these 170 would disturb the averages to any great extent.

Table of height and weight in the 674 cases.

Height.....	5 ft.	5.1	5.2	5.3	5.4	5.5	5.6	5.7
Number.....	10	2	4	14	24	33	65	103
Average Weight.....	128½	141½	131	126	142	138	142½	148
American Standard.....	115	120	125	130	135	140	143	145
Height.....	5.8	5.9	5.10	5.11	6 ft.	6.1	6.2	6.3
Number....	141	84	92	59	30	9	3	1
Average Weight.....	152	163	164	164	173	186	208	235
American Standard....	148	155	160	165	170	175	185	195

We find that the average weight does not vary *materially* from the standard, yet it is in the main *a little above* it.

Having stated the above, we find little else to attract our attention till we come to the deaths among these rheumatic cases; and these we find were 114 in number, *i. e.*, there were 114 of which we were cognizant. Of those who died after they had allowed their policies to lapse, or of the cause or manner of their deaths, of course we cannot speak; but it is just to presume that a fair proportion of these died from the causes which we shall hereafter show to have been so fruitful among the 114 of which we are speaking. These 114 deaths were from all causes.

The heights and weights of these are given in the following table, and do not differ materially from the table of the 844 cases above. In 15 of these cases the weights and measurements are missing; we have therefore made our table upon the 99 remaining.

Height.....	5 ft.	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6 ft.	6.1
Number.....	2	.....	.....	2	4	6	9	18	14	18	15	8	2	1
Average Weight..	115	.....	.....	132	135	142	145	157	155	165	162	161	159	230
Am. Standard.....	115	120	125	130	135	140	143	145	148	155	160	165	170	175

The average age, at death, of the 114 were 46 years and 9 months, distributed among the ages as follows :

Ages....	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	114
No.....	20	26	40	22	6	

As we have said, these 114 deaths were from all causes, but when we examine more critically into these causes of death

among individuals who have had rheumatism, and compare them with the same causes among others who have not had rheumatism, we find that deaths arising from diseases of certain organs, occur far more frequently among those *having*, than among those *not having*, rheumatism.

This is in accordance with the views generally held by medical men, viz., that rheumatism, and especially certain varieties of it, is quite likely to be followed by disease of certain organs, more particularly the heart ; and that, in many instances, the latter disease eventuates in some affection of the brain or in a dropsical difficulty.

We will use, therefore, only three of the causes of death in making our comparison, for the reason that, while many and various diseases come in for notice, these three, viz., heart disease, brain disease, and dropsy, so conspicuously figure as to make it evident that they are the ones upon which the comparison should be instituted.

This comparison is based upon 1,000 deaths, 114 of which furnish a history of rheumatism ; and 886 are without any such history, so far as we can learn.

There died, in 1,000, of—

	Heart Disease. Per Cent.		Brain Disease. Per Cent.		Dropsy, Per Cent.	
With rheumatism (114 cases) . . .	21	18.42	22	19.29	4	3.50
Without rheumatism (886 cases).	35	3.95	101	11.39	16	1.80
Totals.	56				20	

Of the above it is but reasonable to suppose that most of the deaths attributed to brain disease and dropsy should, by *right*, have been included among diseases of heart ; and it is by no means improbable that some of those dying of heart disease or brain trouble, who come under the head of *non-rheumatics*, *ought* properly to have been in the other group.

Thus we see that those individuals who are afflicted with rheumatism contribute to deaths from heart disease about $4\frac{1}{2}$, where those without it contribute but 1 ; brain disease, $1\frac{1}{2}$ to one ; dropsy, $1\frac{1}{3}$ to one.

“ Rheumatism ” is a thing so common that, were we arbitrarily to exclude all who say they have had rheumatism we should almost be unable to do business. Nor is this necessary, for it is only certain kinds of rheumatism that we believe so apt to be followed by heart trouble ; and we now hope, through the form of the new application, to get such particulars of information as will enable us to decide intelligently when to admit and when to exclude rheumatic applicants.

The plan pursued in this investigation was as follows :

The risks were divided into four different classes, according to the several grades of rheumatism, as nearly as could be determined by the statements of the applicants, and the tabulated statement below, prepared by the Actuary of the Company, will show all the points of interest, and is self explanatory.

	Lives.	Exposure.	Expected Mortality.	Actual Mortal.	Ratio.	Duration of Pols.
Rheumatism.	294	2160½	30.57	54	1.766	7.35
Do. slight, occasional.	306	2143¾	29.35	31	1.056	7.00
Rheumatism, acute, fever, inflammatory.	104	681¼	8.98	11	1.225	6.55
Rheumatism in limbs	140	1073¼	14.68	18	1.266	7.66
Totals	844	6058¾	83.58	114	1.364	7.18

I will only add that, in consequence of the vague manner in which many applicants speak of their rheumatism, and the general temptation to conceal the severer forms, or make them appear as insignificant as possible, it is very reasonable to believe that the above ratios do not express the actual facts, but that many of the cases which were designated as "rheumatism" simply, or "rheumatism of limbs," or "slight rheumatism," *ought* to have been classed among the "acute inflammatory" cases.

We give it, however, as it is, believing that we have at least an approximation to the facts, and that hereafter, when we shall be able to get the details in rheumatic cases more fully, we can make a much more exhaustive statement.

The above report is respectfully submitted by

A. HUNTINGTON, M.D.,

Acting Medical Officer.



ANNUAL REPORT
OF THE
MEDICAL DEPARTMENT
OF THE
UNITED STATES LIFE INSURANCE CO.,
For the year ending Dec. 31st, 1875.

TO THE BOARD OF DIRECTORS OF THE UNITED STATES LIFE
INSURANCE COMPANY :

Gentlemen—In reviewing the experience of this Company during the past year, it gives me pleasure to state, in the first place, that the losses from death have not exceeded the “expected mortality.” For the year 1874 these losses amounted to \$348,760 ; while for the year that has just terminated they

reach but \$317,745, not to mention the fact that \$25,000 of this amount is covered by re-insurances in other companies, while the previous year there were no re-insurances to offset the loss. In other words, the reported losses by death for 1875 fall short of those for 1874 by \$56,015.

It also gives me pleasure to state that the system of appointing medical examiners, adopted a few years since, continues to give entire satisfaction. To the care and judgment exercised by our medical supervisors in the different States, the success of this system is chiefly due.

In conclusion, I would respectfully call your attention to the accompanying very interesting and thorough report of my colleague, Dr. A. Huntington.

Respectfully submitted by

ALBERT H. BUCK, M.D.

New York, January 1st, 1876.

TO THE BOARD OF DIRECTORS :

Gentlemen—In the last Annual Report of this department, we gave the results of an investigation into the subject of Rheumatism, and its bearing upon life insurance, as exemplified in the experience of this Company.

During the year just closed, we have been engaged in a study of those risks which, when compared with the American stand-

ard of heights and weights, show either an excess or deficiency of fifteen per cent. or more of weight.

The standard to which we have alluded is here introduced. It is so plain that no explanation is required.

I.—AMERICAN STANDARD, OR TABLE OF RELATIVE HEIGHTS AND WEIGHTS :

5 ft.	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6 ft.	6.1	6.2	6.3
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
115	120	125	130	135	140	143	145	148	155	160	165	170	175	180	185

The time over which this survey extends begins with the organization of the Company in 1850, and ends on the 31st of December, 1873, a period of 23 years.

In order to be thorough in the search, we have found it necessary to scrutinize the record of examination in each individual application made during the period above-named, there being in all 30,000 of these.

The method pursued in collecting the material used in this examination was as follows :

First. All the records of the Medical office were examined in the order of their sequence, that is, according to years, beginning with the first volume and following in regular rotation to the end.

Every recorded examination was carefully scanned, and all the items bearing upon the subject under investigation minuted on cards prepared for the purpose.

Second. We took all the applications on file in the Company's vaults, beginning with number 1, and pursued the same course with them as with the Medical Examiner's records. Thus, every examination and every application was compared with a table showing at a glance the *standard* height and weight, and also the *excess* or *deficiency* which the addition or subtraction of 15 per cent. of the standard would give.

The reason that *fifteen* per cent. was taken was because a *certain amount* of departure from the average or standard was to be expected, and it would therefore be unwise to make our investigations on any except those cases showing a *considerable* variation one way or the other.

Several prominent writers on the selection of lives for insurance give twenty per cent. as the *maximum* of excess or deficiency in weight beyond which it is unsafe to go. We have therefore taken *fifteen* as a fair per centage of over-or under-weight, as our basis in the study of the subject.

Our accumulation of material, then, embraces all those individuals who have been covered by insurance in this Company, whose weight was fifteen per cent. or more above or below the standard requirement. We say our material embraces *all* those individuals, etc. This is true in the main, yet we experienced in the collection of this material the same imperfect and unfinished condition of the applications and medical examinations that we spoke of in our last report. Could we have had all these records complete, our number of cases would have been larger, and the general averages rather more reliable ; still, the

number collected is large enough to give us a tolerably accurate insight into the subject.

After the culling out of the cases from the mass was completed, the cards were arranged in a convenient order, and all the duplicates eliminated. This left a total of 1,496 cases, and of this number, 1,110 were overweights, and the remainder, 386, were light or underweights.

It will at once be seen that there is a wide difference between the numbers grouped under the two heads as above. There are nearly *three* overweights to *one* underweight. This is not the relation that these two classes bear to each other in the community at large, but the reason for it here is this : light weights have always been regarded as more unsafe risks for life insurance than overweights, and as these cases are collected from those persons on whom insurance has been written, we should naturally expect to find just what we do, viz., that the underweights are greatly in the minority.

Whether this discrimination against underweights and in favor of overweights is *wise* or *just*, will appear further on, as the exhibit we shall give throws light upon it.

The material thus collected was taken up, each grand division of over-and underweights by itself, and again subdivided into heights and ages. This can best be shown by the following tables, which we will style the “ *Tables of Material :* ”

II.—TABLE SHOWING THE PER CENT. OF OVERWEIGHT AT THE DIFFERENT HEIGHTS FOR THE AGES FROM 20 TO 65, ARRANGED IN GROUPS OF 5 YEARS EACH.

(The red numbers refer to the number of individuals upon which the calculation is based.)

HEIGHT.	5 ft.	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6 ft.	6-1	6-2	6-3	Totals. Individuals and Average per cent, accord- ing to age.
AGES.																	
20 to 25 Inclusive.....	1 25%	2 20%	1 20%	4 3%	2 30%	1 30%	3 25%	5 25%	12 20%	5 20%	9 20%	7 25%	2 20%				1 30%
26 to 30 Inclusive.....	2 30%	3 30%	1 20%	1 20%	1 20%	1 25%	11 25%	15 25%	27 25%	11 25%	10 20%	11 20%	7 25%	1 25%			194 24%
31 to 35 Inclusive.....	3 30%	5 40%	2 40%	1 25%	4 25%	3 25%	17 25%	21 25%	47 20%	37 20%	30 25%	15 20%	11 25%	1 30%	2 30%	1 20%	117 27%
36 to 40 Inclusive.....	3 25%	3 25%	3 30%	6 35%	5 30%	6 30%	19 25%	24 25%	50 30%	38 25%	42 30%	20 25%	11 20%	3 30%	3 40%	1 20%	250 27%
41 to 45 Inclusive.....	3 35%	3 45%	2 45%	2 45%	5 30%	5 25%	18 25%	24 30%	58 25%	21 30%	27 25%	18 25%	20 30%	2 25%	2 20%	1 20%	206 28%
46 to 50 Inclusive.....	3 30%	1 45%	1 45%	3 20%	6 30%	8 25%	8 25%	17 25%	25 30%	23 25%	20 25%	11 25%	12 25%	5 25%		2 60%	151 30%
51 to 55 Inclusive.....	3 30%	1 35%	1 45%		1 35%	40 40%	30 30%	30 30%	16 30%	11 20%	20 20%	30 20%	20 20%				72 20%
56 to 60 Inclusive.....	3 25%		1 45%		1 35%	1 35%	3 25%	5 30%	3 25%	3 30%	3 30%	3 20%	4 20%				93 28%
61 to 65 Inclusive.....								1 25%	1 20%								2 22%
Totals. Individuals and per cent. of over- weight according to height.....	20 29%	11 34%	8 31%	17 29%	2 28%	27 20%	78 26%	122 27%	255 25%	150 24%	165 25%	106 24%	80 23%	15 27%	7 30%	5 30%	1110 27%

As will be seen by a glance at the above, the overweights at the younger ages are few, as we might reasonably expect, and so, too, the average percentage of excess is lower, being only 23 p. c. and 24 p. c. (except in the group of ages under 20 ; and as in this group but *one* life appears, it is hardly to be considered ; the same is also true of the older group, 61 to 65), where but two lives appear.

The total average of excess of weight in the whole 1,110 individuals is 27 per cent. for all the ages combined. The total average excess for each *height*, from 5 feet up to 6 feet 3 inches, will be found at the foot of its proper column.

Immediately following, we append a similar table for the underweights.

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III.—TABLE SHOWING THE PER CENT. OF UNDERWEIGHT AT THE DIFFERENT HEIGHTS FOR THE AGES FROM 20 TO 65, ARRANGED

IN GROUPS OF 5 YEARS EACH.

(The red numbers refer to the number of individuals up in which the calculation is based.)

HEIGHT.	5 ft.	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	6 ft.	6.1	6.2	6.3	Totals. Individuals and average per cent. accord- ing to age.
AGES.																	
To 20 Inclusive.....	25%	1		20%	6	5	11	20%	4	1	2	20%	15%	1			45 19%
21 to 25 Inclusive.....				15%	5	9	10	20%	11	13	14	20%	20%	3			8 19%
26 to 30 Inclusive.....			25%	25%	7	7	8	20%	16	14	14	20%	20%	1			90 21%
31 to 35 Inclusive.....		1			5	8	10	20%	4	9	12	20%	20%		1		01 20%
36 to 40 Inclusive.....		20%		15%	6	4	11	20%	3	6	8	20%	15%	1			50 18%
41 to 45 Inclusive.....				15%	7	2	7	20%	1	3	5	20%	20%				8 19%
46 to 50 Inclusive.....				20%	1	2	1	20%	2	2	1	20%		1			12 20%
51 to 55 Inclusive.....				20%		1		20%	1		1	20%	25%				6 19%
56 to 60 Inclusive.....				25%	1	25%		15%	2	1	20%	20%	20%	1			4 21%
61 to 65 Inclusive.....							20%			25%				15%			20%
Totals.		1	1	8	50	38	60	40	51	45	60	30	11	3			380
Individuals and per cent. of under- weight according to height.....	25%	20%	25%	20%	19%	21%	20%	19%	18%	21%	20%	20%	10%	20%	20%		20%

The *deficiency* of weight in the *younger ages* here would not excite particular comment, because we naturally look for lighter weights in young people than in those of middle age, and the table of standard weights, too, is based upon observations made on given heights of *all ages*; therefore it is only because the average per cent. of deficiency is so *widely* different from the standard that we are enabled to attach any importance to it.

It will be seen that 20 per cent. deficiency is the average for all ages combined, and about the same for each height. The individuals, therefore, who compose this class, are on the extreme border of the ground usually considered allowable for writing insurance; and the heavy weights in the preceding table average a still higher percentage of departure from the standard, both in the combined ages and for each division of height, being over 27 per cent.

Having thus arranged our material for observation, it will be in order to inquire what are the results of the business done by the Company on these two classes of risks during the interval between 1850 and 1874.

This we now proceed to do.

Through the kindness of Mr. W. D. Whiting, the Actuary of the Company, we have been furnished with the following :

NEW YORK, December 10th, 1875.

DR. A. HUNTINGTON :

Sir—The result of my examination into the 1,496 instances

of 15 per cent. excess or deficiency in weight as compared to height, out of the 33,000 persons insured in this Company, is, after eliminating duplicates, as follows :

	Lives.	Exposure.	Expected Deaths. (Actuaries Mort.)	Actual Deaths.	Ratio of Actual to Expected.	Average Duration of Insurance (Yrs.)
Overweights, 15 p. c. and over . . .	1,110	6.826	95.61	103	107.6	6.15
Underweights, 15 p. c. and under.	386	2.440	26.05	42	161.2	6.22
Totals.	1,496	9.266	121.66	145	119.1	6.18

Yours truly,

WM. D. WHITING,

Actuary.

Attention is here called to the ratios of *actual* to *expected* mortality.

In both classes it will be seen that the actual is greater than the expected mortality, to an extent that makes it *marked* ; and in the class of underweights very *decidedly* so. Both of these classes, then, have been *non-paying* to the Company, and the latter to a much greater extent than the former.

Out of these 1,496 cases there have been 145 deaths, 103 of which were contributed from the 1,110 overweights, and the remaining 42 were contributed from the 386 underweights.

An analysis of the causes of death in each of these classes is given below :

<i>Causes of death among Overweights.</i>	No. of Cases.
Apoplexy, and diseases of brain.	17
Bright's disease.	2
Consumption.	6
Dysentery, and diseases of bowels.	11
Dropsy, diseases of heart and liver.	28
Erysipelas, pyaemia, diphtheria and fevers.	8
Pneumonia and congestion of lungs.	7
Poison, accident and violence.	10
Rheumatism.	3
Tumors and cancer.	5
All other causes.	6
<hr/>	
Total.	103

<i>Causes of death among Underweights.</i>	No. of Cases.
Apoplexy, and diseases of brain.	4
Bright's disease.	1
Consumption.	25
Dysentery, and diseases of bowels.	3
Dropsy, diseases of heart and liver.	5
Erysipelas and fevers.	2
Pneumonia.	1
All other causes.	1
<hr/>	
Total.	42

It will be observed at once, that among the overweights, the most common and fruitful causes are diseases of brain, heart and liver, amounting in all to nearly 44 per cent. of the whole number of deaths in this class. Among the underweights, on the other hand, we are struck with the excessive preponderance of consumption alone, over all other causes, $59\frac{1}{2}$ per cent. of the deaths in this class arising in consequence of this one disease.

By comparing the above with the analysis of the first 1,000 deaths in the Company at large, we have this showing :

Percentage of deaths in Company at large, from

diseases of brain, heart and liver 23 per cent.

From same diseases, in class of overweights 44 per cent.

Now among the underweights, the comparison is :

From Consumption, in Company at large 27 per cent.

From consumption, in class of underweights $59\frac{1}{2}$ per cent.

These results, *in their nature*, are not different from what we should expect to find, but in the *extent* to which they go, they are so marked, that we are forced to the conclusion that persons belonging to either of these classes should be admitted to the company only after the most *rigid examination*; but beyond this, until the question has been further investigated, we would not advise the establishment of any *arbitrary* rule in regard to these risks.

In this connection, it will be interesting to see how much of consumptive taint was found in the family history of the individuals comprising the two classes we are observing.

IV.—TABLE SHOWING THE PER CENT. OF CASES HAVING A CONSUMPTIVE TAINT IN THE FAMILY HISTORY, THE INDIVIDUALS BEING GROUDED IN CLASSES ACCORDING TO AGE.

A, OVERWEIGHTS.

Ages....	Under 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	Totals.
Total No. of individuals showing an excessive weight.	1	54	123	217	250	206	150	72	35	2	1110
No. of individuals whose family history shows a consumptive taint.....	0	4	12	28	45	29	22	8	7	0	155
Percentage.....	0%	8%	10%	13%	18%	14%	15%	11%	2%	0%	14%

B, UNDERWEIGHTS.

Ages....	Under 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	Totals.
Total No. of individuals showing a deficiency in wght.	45	83	90	66	56	28	12	6	4	2	386
No. of individuals whose family history shows a consumptive taint.....	3	15	10	9	11	4	1	1	1	1	56
Percentage.....	7%	19%	10%	15%	20%	14%	8%	17%	25%	50%	14½

These family records are no doubt incorrect, or, rather, deficient in the amount of taint which they exhibit, for it is well known that many applicants are careful not to mention such taint when it is present in the family, because of the fact, which is pretty well understood in the community, that a consumptive record is a great barrier to the obtaining of insurance; still, these deficiencies being as likely to affect one class as the other, it will probably make but little difference in our relative percentages.

Among the overweights nearly 14 per cent. show a taint in the record, and among the underweights about $14\frac{1}{2}$ per cent.,—not much difference—yet, notwithstanding this, we find consumption feeding upon the underweights, while it scarcely touches the overweights—only 6 per cent. of the deaths in that class being due to this cause.

In the company at large the hereditary taint, as exhibited in the family histories of applicants is a trifle over 5 per cent. We should not, perhaps, have been surprised to find the amount of consumptive taint among the underweights exceeding that of the company at large, but we are somewhat surprised to find it thus among the overweights, and are at a loss to give any explanation, except that it may in part be accounted for by supposing that individuals with a consumptive family history may have been admitted by the examiner, on the ground that their great weight contraindicated and to some extent counterbalanced their hereditary proclivities. (It must be borne in mind here that we are speaking only of the percentage of *taint* as shown in

the family records, and not of the *mortality*, for it will be remembered that we found the deaths among the overweights were to a very small extent due to consumption or anything akin to it.) The above may serve to partially explain away the amount of taint shown among the overweights. The rest must be attributed to accident.

The fact, however, proves, so far as it goes, that the conclusions of examiners, that a consumptive taint, when joined to heavy weight in the person of the applicant, does not count so heavily against the risk, are correct.

The results thus obtained go to sustain the heretofore generally received opinion that extremes of over-or underweight are not healthy risks for Life Insurance Companies to write upon, and while this is true of both classes, it is very *emphatically* true of the underweights, as the remarkable excess of *actual* over *expected* mortality will show. Among the overweights the most common manner of death, as we have seen, is by diseases of brain, heart and liver ; but while the mortality in this class of risks is considerably above the expectation, it does not approach the excess shown among the underweights from diseases of lungs.

* We are not to reason from this that all light weights are especially subject to consumption merely *because* they are light weights, but we are to apply still more rigidly to practice the fact we already knew, viz.: that consumption *very, very* often does send out its warning voice far in advance of its actual coming, and as "coming events cast their shadows before," so we believe, in many cases, this interference with the tissue-

making powers of the human system foreshadows the coming of this scourge of humanity—tubercular consumption.

For this reason we are to consider marked underweight in an applicant as a very serious matter, even though it be attended by no visible impairment of the health.

With overweights we are to use great caution in the selection, but are not to look on them with the same degree of apprehension as on the other class.

Hoping that the time and labor spent in the study of this subject may prove of value to the Company, this report is respectfully submitted by

A. HUNTINGTON, M.D.

ANNUAL REPORT
OF THE
MEDICAL DEPARTMENT
OF THE
UNITED STATES LIFE INSURANCE CO.

For the year ending Dec. 31, 1876.

TO THE BOARD OF DIRECTORS OF THE UNITED STATES LIFE
INSURANCE COMPANY :

Gentlemen :

Nothing of special importance has transpired in the medical department during the year which has just come to a close. The reported losses by death amount to \$261,860, whereas, during the previous year, they amounted to \$317,745, a gain of \$55,885, for the year just terminated.

I might also state that the experience gained during the past year has led us to resort more frequently than ever before to the chemical and microscopical examination of the urine as a means of gaining additional light upon the character of the risks submitted to us. The thermometer, too, has in several instances afforded us valuable aid ; and while it does not yet appear practicable to inaugurate a rule requiring the use of this instrument in the examination of every applicant for life insurance, I would take this opportunity of urging upon our examiners the desirability of resorting to this test in every case where they are in doubt regarding the significance of certain apparently trivial symptoms, or where the general aspect of the applicant or his family history would lead them to look closely for the slightest indication of pulmonary phthisis.

Finally, I would call your attention to the very interesting researches which form the subject of my colleague's report. It will undoubtedly be read with pleasure by many not directly interested in the bearings of this subject upon life insurance.

Respectfully submitted by

ALBERT H. BUCK, M.D.

NEW YORK, January 4th, 1877.

TO THE PRESIDENT AND DIRECTORS OF THE UNITED STATES
LIFE INSURANCE COMPANY :

Gentlemen :

For several years past it has been the custom of your medical officers to present, in conjunction with the regular annual

mortuary report, a paper on some subject, coming properly within the sphere of our observation, and germane to the business of Life Insurance.

In our last paper we discussed the importance of closely observing the relations existing between the height and weight of applicants as compared with a given standard ; and indicated what we considered the points of special importance brought out.

This year we have been occupied with a sort of general survey of the subject of longevity, and have interested ourselves in trying to find some more satisfactory answer to the old but ever important question: How may we judge who of those presented to us have a reasonable expectation of reaching old age? And intimately connected also with the foregoing, arises this second question: How far length of days is an inheritance bequeathed to us, or how far is it due to habits, climate, occupation and the like?

To aid us in the study of these questions we thought it would be well to collect the histories and experience of as many male lives as possible who had reached the age of three score years and ten. To this end we prepared a blank consisting of a series of questions, which were arranged under two main heads relating respectively to the family and personal histories of the man. These main heads were again sub-divided: the first part referring to the family and personal histories of the individual at the time he was thirty years of age ; and the second part to the subsequent changes that had occurred in those histories. The

inquiries in regard to family history included grand-parents, parents, brothers and sisters, their ages, causes of death, &c., &c.; while in the personal history the inquiry related to distinctive personal features, resemblance to parents and its degree, occupation, residence, condition in life, health, habits, hours of rising and retiring, kind of diet, &c.

These blanks were placed in the hands of our medical examiners and chief agents in different parts of the country, and although there has not been that response to our efforts that we hoped for, still a goodly number of reports have been gathered, and we now propose to look into them and see what they show.

First, then, a word as to the material; this embraces one hundred and eighty cases of old men gathered from all walks in life, and following many different professions, trades and callings. All of them are now of course over 70 years of age, and we find the average age reached to be 77.5-12 years, the greatest being 96. Ten of the others are over 90, and fifty-eight over 80.

By a study of the individual histories of these 180 persons, we have been enabled to gain a little insight into the causes of long life, or at least to judge somewhat correctly how much these old men are indebted to their forefathers for their length of days, and how much of it was due to their own care of themselves conjoined with the surrounding circumstances under which they had lived.

In this study we have endeavored to ascertain, first, what

there was in the families of these septuagenarians that might reasonably be expected to interfere with their prospect of life, *i. e.*, what of transmissible taint calculated to abridge life they had inherited from their parents, (the question of the transmissibility of certain diseases, or rather of the tendency to certain diseases, is too well established to require argument here). With this view we have searched their family histories for the presence of—first, consumption ; second, cancer ; third, insanity (syphilis for obvious reasons could not be considered). Cancer and insanity appear so faintly in the records as to be practically of no account ; and, consequently, we are narrowed down to the first—consumption, and this, after all, is for us the most important of the three.

The investigation of the family histories, with regard to this strongly hereditary affection, was made from the records as they appear at the time when the writers of them (the old men from whom we obtained the blanks) were thirty years of age ; and the reason why this age was selected, is, because that is the time in which, as writers of life insurance, we are most interested, for it is around about this age that the bulk of insurance is effected. It is about this time, too, that the development of the body is matured, and the health, habits, modes of life, and the results to which they tend, are tolerably well declared.

Proceeding, then, on this ground, we have taken all the records showing the presence of consumption in the family at the age named, and have arranged them in groups after the following manner:

First.—Those cases showing the presence of the disease in the parent and other members of the family.

Second.—Those in which only one parent had died of the disease.

Third.—Those in which several of the brothers or sisters, or both, had been consumptive ; and

Fourth.—Those cases exhibiting the presence of the disease in only one brother or sister.

In no case have we found *both* parents dying of consumption before the respondent* in the case had reached 30 years, and in the few cases that occurred at a later period, the parents were well advanced in years, so that it was questionable whether there was really any constitutional tuberculosis present.

By a study of the tables appended to this report, we find in all twenty-eight (28) cases showing one or more members in each of the 28 families to have died of consumption before our respondents had arrived at 30 years of age.

These cases are distributed as follows, among the groups:

- Group One.....three cases.
- Group Two.....twelve cases.
- Group Three.....five cases.
- Group Four.....eight cases.

[As before stated, there were no instances in which both

* For the sake of convenience, we shall use the term "*respondent*" where we have occasion to allude to the individual who furnished the information contained in the blank.

parents had died of consumption before the respondent had reached thirty. In case two of group three, the parents are reported as dying of "bronchitis" and "consumption" respectively, at advanced ages; and in case six of group four, both parents are reported as dying of cancer at very advanced ages.]

Let us now take up these groups and apply the rules by which we judge of applicants for life insurance to-day, and see what would have been our probable decision as medical examiners, in regard to the respondents in these cases, had they applied to us for insurance, all of whom have proved themselves good risks, for the very obvious reason that they are all alive, and have greatly exceeded their expectancy—the expectancy of life at age 30 being 62 years.

In group one, case one would have been rejected, because the mother and three sisters were already dead of the disease, the applicant himself resembling the mother, and being of light weight.

Case two would probably have been refused a *life* policy but granted a ten or fifteen year endowment, two of his family having died of consumption; but he being 30 years of age, sound, *above* average weight, a farmer, and resembling the father in a marked degree, would have been considered entitled to the kind of policy named; his grand-parents, too, were old. It will be noticed that a brother and sister subsequently died of the disease, while he escaped. Case 3, judgment same as in case 2, viz.: short endowment; for although he resembled the mother,

his age, being above standard weight, of good habits and healthful occupation, would have rendered him eligible.

This completes group I., and we believe our decisions in these cases would have been the proper ones to make, according to the light we should have had at the then ages of the applicants. We should, indeed, have thrown out entirely what subsequently proved to be one good risk, but of course, being able to make an estimate only of the *probabilities* of the future, our conservative course would have been the safe one for the Company to follow at that time, and life policies could have been granted subsequently if the advancing lives of the applicants seemed to warrant it—say after the ages at which the parents died.

GROUP II.—Number one doubtful ; if inquiry had developed the fact that the mother's "feebleness" was not at all due to consumptive trouble, he would have been granted an endowment at least, and probably a life policy for a reasonable amount. Number eight declined, or a short endowment only might have been issued. Numbers two, three and four declined. Numbers five, nine, ten and eleven accepted. Number six a short endowment probably. The acceptance of number seven would have depended on the history and character of his "rheumatism." Number twelve, accepted if not too much below standard weight.

GROUP III.—Number one would have been postponed till later in life, on account of family history and his light weight. Numbers three, four and five would have received endowments only.

GROUP IV.—Cases one and seven would have been accepted, provided they were not too much below the standard in weight. Cases two, three, four, five, six and eight would, in all probability have been accepted.

Thus, we find the result in these twenty-eight cases, whose histories show a consumptive taint, to be, ten accepted for life policies and six for endowments. Six would have been rejected altogether, and in regard to the remaining six there is a doubt as to what the decision would have been.

Attention is called to the fact that only twenty-eight cases ($15\frac{1}{2}$ per cent.), out of the one hundred and eighty, are reported as having a consumptive taint known to exist at the time the respondent was thirty years old ; and out of these twenty-eight, sixteen would probably have received policies, leaving only twelve, and some of them doubtful, to be rejected on the ground of consumptive taint, out of the whole one hundred and eighty—certainly a remarkably small number, only about six and two-thirds per cent.

We find, then, in the first place, that in these one hundred and eighty individuals who have lived so far beyond their expectancy, there was *much less* than the *usual* amount of consumptive taint (for the experience of all life offices shows that the percentage of applicants with a consumptive taint in their family histories is considerably greater than that found here) ; and secondly, we notice that the *degree* of taint was not so great, but that a large number out of even these twenty-eight cases would have been found insurable. So, therefore, applying to

these cases, as we have done, the rules which guide us at the present time in forming our judgment of applicants with a consumptive record, we find that our practice of dealing with them is sustained as being reasonably safe to the company, and at the same time *not unjust* towards the applicants themselves ; for, according to our rules of judgment, *nearly all* of these applicants would have been admitted to the benefits of insurance, and their subsequent long lives remain as evidence of the wisdom of the selection.

May we not reason, then, first, from the *small number* of this class of cases (among the entire group of the one hundred and eighty) that the long lived do not come from those families which have in them the taint of consumption ; and, second, while the above is true as a whole, yet, from the fact that the few persons, in whose family histories such a taint existed, still lived to reach old age, may we not also reason that there are not unfrequently individuals in those families who either are not touched by the taint, or else have within themselves a power of overcoming it, which, assisted by healthful habits, occupation and surroundings, renders them superior to the destroyer ; and, thirdly, may we not reason still further from the small number of rejections which the application of our rules would have caused among these cases, that at the age of thirty, a thoroughly competent examiner, taking cognizance of all the points which our rules require, may select with *reasonable certainty* and *safety* his exceptions from among the mass of those applicants with tainted record, who are placed under his observation ?

Again, we are led to the conclusion that at thirty years of age with the majority of men, the fact is pretty well established whether or not there is a consumptive taint in the family, for among our old men, where we find deaths from the disease recorded subsequently to that age, they mostly occur as sporadic cases, and at such advanced ages, as to warrant us at least in questioning whether they ought to be considered at all as cases of hereditary consumption.

Out of our whole 180 cases, there were 146 who reported in what respects they resembled either father or mother. The showing is as follows :

There were 75 who resembled their fathers in *features*, and 82 who resembled them in *build*. Of those who resembled their *mothers* in *features* there were 71, and of those who resembled them in *build*, 59. There were some who resembled both parents equally.

In regard to the *color of eyes*, we find the count to stand as follows in the order of their frequency :

There were 100 having *blue* eyes, 41 having *grey*, 25 with black, and only 14 with brown eyes.

Four instances only of myopia (near-sightedness) are reported. One case of "poor sight" is named, and one pair of black eyes were extinguished at fifteen years of age.

The color of hair was given with the following order of frequency : *brown* most frequent, 83 cases ; *black* next, 70 cases, then *light* hair, 14 ; and last, *auburn*, 11 cases. (Gray hair, at

30 years of age was reported in but two instances.) Among all these, 156 were blessed with a full head of hair, and only 24 showed any evidence of baldness. In answer to the very common belief that people with hairy bodies (Esau's) live longer than those with smooth skins, we find but 30 of these 180 septuagenarians who were hirsute.

Twenty-one cases speak of having poor teeth, and *only eight had hernia*, two of which were double.

In reply to the question as to how their bodily vigor compared with the average of men at 30, there were 85 who judged themselves to have been *above* the average, and 11 who were *below*; all the rest reported as average.

In answer to the same question in regard to their weight, there were 32 *above* average and 36 *below*; the remainder, average.

To the question, "Was your voice full and strong?" there were only 8 answers in the negative.

Now, we come to an important item, that showing the habits of these old men, in the use of alcoholic spirits. At 30 there were 54 *total abstainers* from its use (a rather unusual thing in those days) against 84 later in life.

Of *habitual*, yet moderate users, at 30 there were 14, against 13 in later life, and of *occasional* moderate users at 30 there were 105 cases against 69 later on. Those reported as *intemperate* users at 30 were 7 in number, and in later life 6, so reported, and it may be well to state in this connection, that in a letter

received during the summer from a medical gentleman in the far West, he informed me that he would be able to furnish quite a number of cases whose history would show that they had been hard drinkers of whiskey all their lives, and yet had lived to be old men.

Accordingly I looked forward to the arrival of the blanks with considerable interest, for it seemed as though these were to be a regular shower of bombshells into our preconceived ideas of the effects of whiskey drinking. It proved, however, that when the Doctor came to investigate these cases more closely, he found to his surprise, that out of his "Old guard of whiskey braves," as he called them, only one or two had reached the age required in the blanks, although the whole lot of them were "*old looking, grey, bent and feeble* ; but now to offset this I have the history of an individual kindly furnished by a physician in one of the Eastern States. I will use the Doctor's own words in the description.

"He is between 85 and 90, has always lived poor and fared hard ; has probably been drunk many thousands of times, and has used tobacco *immoderately* all his life ; still, I often meet him on my drives, sometimes with his fishing tackle, sometimes with his gun, and at others with his axe, and I think he prepares for the stove all the wood used."

What a rare picture of a man, so old yet so fond of fishing-tackle and gun, and still able to use them.

In reply to our inquiry, we learn that 151 of our respondents

were leading a married life at the age of 30, and only 29 were single ; and that, subsequently, 25 out of these 29 entered into the matrimonial estate, so that 176 out of the 180 have led a married life, more or less, and *only four* “fought it out” on the line of *single blessedness* ; and now, if this statement shall be read by any bachelors, and it does not induce them to repent and get married, then statistics have no influence as a converting power.

Under the head of *Occupation* at 30, we find 17 following the liberal professions, 26 engaged in mercantile pursuits, 62 working at trades, and 77 more or less engaged in agricultural life, (under the head of trades, we include a few whose business was on the water). Subsequently to 30, we do not find any great number changing their trades or callings.

In regard to the use of tobacco (concerning whose influence on health and life there seems to be quite a difference of opinion) the record of these old men stands as follows :

At 30, there were 64 who did not use it in any form, and 113 did use it either in the form of smoking or chewing, or both ; *not once* was snuff-taking reported ; the remaining three cases made no report under this head (and we may say here, that on any of the points, where the figures are given, and they do not foot up 180, there were no reports given under those heads by the missing cases).

In the way of sickness previous to 30, quite a number report “fevers,” “typhus” and “typhoid,” “bilious,” etc. ; several report “rheumatism,” one “lumbar abscess,” one “spinal

disease and renal calculi ;” several report “pneumonia,” one “spotted fever,” and two had “*spat blood.*” After 30, the characters of the illnesses reported do not differ very materially from those of earlier life, except that they occur more frequently in the records : this, however, we should look for, because the number of years covered, from 30 to the present time, is much greater, and this period embraces the most active part of the life of man. Accidents and bodily injuries, we notice more frequently, and so also, “all the ills that flesh is heir to.”

Under the head of *residence*, the majority of our respondents report themselves as having spent the greater portion of their lives in “the country” as distinguished from “the city,” but this is a matter of very little importance in our investigation, owing to the fact that the inquiry was not pushed to the same extent in city places as in the country.

Thirty-three cases are reported as having suffered more or less from malarial poisoning during their past lives. Almost all report “no vacation or systematic recreation,” but on the contrary, a pretty uniform and steady attendance to business during the whole of their lives.

We find that 9 have been in the habit of using coffee alone, that thirty have used tea alone ; 125 have used both coffee and tea, and there are but 8 instances in which neither one was used. As to their diet, nearly all subsist on mixed animal and vegetable food, and not more than two or three report themselves as vegetarians.

We would call attention to what seems to us an important item among the facts elicited by our inquiries, viz.: that these old men were *early retirers to sleep*, and *early risers* in the morning; very few exceptions to this are found among them, and we state it as our firm belief that habits of early rising and retiring conduce greatly to the preservation of the freshness and strength of both body and mind.

In regard to their present condition of bodily health, very nearly all these old gentlemen, who range, as we have before remarked, from 70 to 96, report themselves as able to take outdoor exercise *on foot*, and some of the oldest are still able to chop wood and do "chores" about the farm.

The ages of 238 grandparents are given, showing an average of 74 4-12 years to each individual, and in the records of parents, their ages are given in 317 instances. The average age attained by the fathers is 71 2-12 years, and by the mothers 72 4-12 years. The inferences to be drawn from the above averages are very plain.

One interesting case of family longevity we notice. The respondent himself is now 92 years old, his father and mother died at ages of 86 and 94, respectively; four brothers reached 77, 82, 85 and 90; two sisters lived to be 85 and 92. This comprised the whole family, none having died in childhood, early or middle life.

Still another item of interest is that of a *six-fingered family* in which for several generations the respondent's ancestors were en-

dowed with these extra digits ; he himself has them, and so also have all of his children.

I am indebted to Dr. J. L. Sweet, of Newport, N. H., for some interesting vital statistics regarding that town. Some of the facts are not out of place in our report. During the past forty years, during which the Doctor has been an active practitioner in the above-named locality, he says there have been 1480 deaths out of an average population, during the period mentioned, of 2100 individuals. Out of these 1480 cases, 197 reached the age of 70 years ; 180 lived to upward of 80, and 35 reached beyond 90, one of whom lived to about 100, and another to 101 1-2 years. He adds : "These two centenarians were soldiers in the war of our independence, and according to their statements, their deprivations and sufferings from hunger were almost incredible."

About twenty per cent. of the 1480 died from consumption, of whom the ratio of females to males stood as about two to one.

We shall notice one more interesting instance coming to our knowledge, while perusing these records, and then we are done. Many years ago a little book appeared, entitled Riley's Narrative, giving an account of the shipwreck of a vessel on the north coast of Africa, and the capture and enslavement of the crew by the Arabs.

It now transpires that one of our old men (77 years of age) was a cabin boy on that ship. He lived to escape from his

captors, and subsequently spent 15 or 20 years in Mexico. Now after an eventful life he is residing quietly in New England.

All of our data were gathered within the limits of the Union, coming mainly from the Eastern and Middle States. Some were from the West and none from any of the Southern States.

Our thanks are due to the gentlemen who have so kindly devoted their time and patience in securing the records for us, and to the officers of this Company who have aided us by all means that lay in their power.

We trust the time we have given to this subject has not been spent in vain, but that some good may result, if in no other way, at least in stimulating our examiners to a more thorough appreciation of the value of family histories, and in rendering agents more charitable towards medical officers who find it necessary often to reject applicants, and especially young lives, with "tainted" records.

With best wishes for the "Old United States," her trusty officers and valuable corps of hardworking agents, the above is respectfully submitted.

A. HUNTINGTON, M. D.

GROUP I.

ONE PARENT AND ONE OR MORE BROTHERS OR SISTERS CONSUMPTIVE.

No. of Case.	Present age of Resp'd'nt.	Weight compared with Standard.	Members of fam. dead of Consumption and their ages.	Which Parent the Resp'd'nt resembles.	History of rest of family, Resp'd'nt being 30 years of Age.	Subsequent developments in Family History.	Respondents mode of life and surroundings.	Ages attained by G. Parents.
1	79	Below.	Mother 37, three sisters ages not given.	Mother.	Father dead. Brother and three sisters living and healthy.	One sister yet living (82). One sister died at 82. One sister died at 68.	Has been merchant and banker; used no liquors. Has had little or no marital trouble; general health been good.	Grand parents reached ages 29, 66, 87, 82.
2	71	Above.	{ Mother 53. Brother 18.	Father very markedly.	Father living, in good health. Two brothers and a sister living, in good health.	Father died at 67. One brother still alive at 62 years. One brother and one sister died of consumption at 31 and 32.	Has followed the life of a farmer; been an occasional moderate user of liquors. When a young man, had some spitting of blood, which physicians told him came from his lungs. He strained himself at wrestling about this time.	Grand parents lived to be 75, 67, 83, 72.
3	90	Above.	Mother 36. Sister 18.	Mother.	Father and three brothers living, good health.	Father died at 73. Brothers at 69, 78, 84.	Has been farmer and chairmaker; a temperate user of liquors; active, enjoyed generally good health.	Were all old, ages not known.

GROUP II.

ONE PARENT CONSUMPTIVE.

No. of Case.	Present Age of Resp'dnt.	Weight compared with Standard.	Resembles which parent ?	Which parent died with Consumption.	Age.	History of rest of family at age of 30.	Subsequent developments in Family History.	Mode of life and surroundings.	Ages attained by G. Parents.
1	74	Above.	Father.	Father.	59	Mother living, feeble. A brother and four sisters living, in good health.	Mother died at 75. Has two sisters yet living ; old people. Brother and two sisters died over 50 years of age, one 71 with cancer.	Has been farmer and hotel keeper, used no liquors ; generally good health.	Not stated.
2	74	Average.	Father.	Mother.	66	Father, two bros. and a sister living, in good health.	Father died at 84. Brothers and sisters all died at advanced ages.	Has been a teacher, stationer and farmer ; used no liquor ; was weak and puny, when quite young, grew stouter with age.	G. Parents from 68 to 75.
3	72	Average.	Mother.	Mother.	55	Father, brother and three sisters living, in good health.	Father died at 71. Brother and sisters still living, good health, 65 to 77.	Followed a farmer's life and used liquors freely.	G. Parents 69, 89, 73, 81.
4	71	Average.	Father.	Father.	Not stated.	Mother dead. One sister alive, in good health.	Sister still alive, age 75.	Was a cooper at 30, has followed farming since, always in good health. Has at times been an immoderate user of liquors.	Not stated.

GROUP II.—(Continued.)

ONE PARENT CONSUMPTIVE.

No. of case.	Present age of Resp'd't.	Weight compared with Standard.	Resembles which parent ?	Which parent died with consumption.	Age.	History of rest of family at age of 30.	Subsequent developments in Family History.	Mode of life and surroundings.	Ages attained by G. Parents.
5	71	Average.	Mother.	Father.	59	Mother, three bros. and nine sisters living and in good health.	Mother died at 74. Three brothers yet alive, eldest 81. One sister living, age 83; two sisters died of cancer.	Has followed mercantile life; been in general good health, of good habits, etc.	G. Parents (two G. fathers) 88 and 77.
6	76	Below.	Not stated.	Mother.	Not stated.	Father dead. No other record.	No record of bros. or sisters, if ever had any.	Has been a merchant. Had some severe illnesses, nature not stated. Always temperate in use of liquors.	Not stated.
7	75	Average.	Both somewhat, Father most.	Mother.	61	Father, two brothers and three sisters living, one brother dead.	Father died at 90, one bro. still living at 73, rest all dead, one reached 84.	Has been a farmer. Nearly a total abstinence man. Had thenismatism in early life; is now asthmatic.	G. Parents 50, 60, 75, 90.
8	75	Below.	Not stated.	Father.	49	Mother and four sisters living, mother an invalid. Two brothers dead.	Mother died at 64 with pleurisy. One sister now living at 70, rest all died in middle life.	Has been a farmer; used little liquor in early life, total abstinence since. Generally good health and habits.	Not stated.

GROUP II. — (Continued.)

ONE PARENT CONSUMPTIVE.

No. of case.	Present age of Resp'd't	Weight compared with standard.	Resembles which parent.	Which parent died with consumption.	Age.	History of rest of family at age of 30.	Subsequent developments in family history.	Mode of life and surroundings.	Ages attained by G. Parents.
9	78	Above.	Mother.	Father.	28	Mother, three bros. and three sisters living, good health. Two bros. dead.	Mother died at 91. One bro. yet alive 82. Several bros. and sisters lived to be over 80. One sister died with cancer.	Has been a sailor and farmer, used no liquor. Had some malarial trouble, but generally good health.	One G. father 79. One G. mother 93.
10	70	Average.	Father.	Father.	46	Mother, two bros. and three sisters living, good health.	Mother died at 67, rest died in middle life, one brother at 67 with consumption.	Has been a mechanic of good habits and good health.	Not stated.
11	70	Above.	Father.	Father.	50	Mother, three bros. and two sisters living in good health.	Mother died at 90, a bro. and sister at 40 with consumption, two other bros. died 45, 50, older sister 70.	Has been a butcher, in early life used liquors moderately, later on became a total abstainer, was a great smoker all ways.	Stated simply, they were old.
12	73	Below.	Father.	Father.	Not stated.	Mother, four bros. and a sister living, and in good health.	Mother died at 77; brother all over 60 one 84. Sister died at 90.	Has led life of a farmer and lumberman, generally healthy. Moderate use of liquors early in life; later on, total abstinence.	G. parents 75 to 85.

GROUP III.

MORE THAN ONE BROTHER OR SISTER CONSUMPTIVE.

No. of Case.	Present Age of Respondent.	Weight compared with Standard.	Brothers or Sisters Consumptive.	Ages.	History of rest of family at age 30.	Subsequent developments in Family History.	Occupation, Habits, &c., &c.
1	76	Below.	Brother, Sister.	25 19	Father, mother, two brothers, and five sisters living and in good health. Some of G. parents old.	Father died at 86, mother at 81. A brother and three sisters died of consumption in early life.	Farmer, always, a total abstainer from alcohol. Always good health.
2	79	Below.	Three. Sisters.	20 21 22	Father and mother living. G. parents over 60 one side and over 80 on the other.	Father and mother died at 76 and 52; former of bronchitis, latter of consumption.	Tanner and farmer. Moderate user of alcohol till 30; afterwards total abstinence.
3	79	Average.	Brother. Sister.	35 40	Father, mother, brothers, and sisters living. G. parents were old.	Father, brother and two sisters died of consumption. Mother died 71.	Was a weaver at 30, afterward became manufacturer and merchant. Habits good. Some bodily injuries. Good health.
4	87	Above.	Four Sisters	16 22 24 31	Father and mother dead. Father with asthma at 58. Five brothers and one sister living; all in good health.	Brothers (five), and sisters all lived to be old, all 70 and over.	Farmer, always healthy. Always total abstainer from alcohol. Has suffered 20 years past from Epithelioma of nose causing much deformity.
	81	Below.	Two Sisters.	18 26	Parents dead; father at 56 with congestion of lungs. Five bros. and a sister in good health. G. parents were all old.	A brother living aged 87, others all dead, some were over 80, all were old.	Followed farming always. Health generally good. Was always a total abstainer from alcohol.

GROUP IV.

ONE BROTHER OR SISTER DEAD WITH CONSUMPTION.

No. of Case.	Present Age of Respondent.	Weight compared with Standard.	Brother or Sister died of Consumption.	Age at Death	History of rest of Family at Age 30.	Subsequent Developments in Family History.	Occupation, Habits, and Surroundings.
1	70	Below.	Sister.	20	Father and mother living, also three brothers and four sisters.	Father died at 66, mother at 89. Brothers and sisters averaged well, one sister over 80. Two sisters died of pulmonary disease at 42 and 60 years.	Followed farming, was tall and slim, always had good health. Habits good.
2	76	Average.	Sister.	20	Mother died at 48 of paralysis. Father and three bros. living, good health. G. parents were old.	Father lived to be 88, one bro. reached 70, others died under 60.	Has followed office business generally, "clerk," &c. Had always a hoarse, weak voice. Generally healthy, though has had pneumonia. Habits good.
3	82	Average.	Sister.	40	Father, mother, two bros. and three sisters living. G. parents lived to be 91, 85, 81, 61.	Father died 76, mother at 77. brothers and sisters all passed middle life, two sisters over 80.	Has been a farmer all his life. Always had good health, though not strong before 30. Habits good. Total abstinence from liquor since 50.
4	88	Average.	Sister.	40	Father living, mother dead. Three brothers and three sisters living, good health. G. parents 70, 71, 86, 86.	Parents died at 80 and 63. Bros. all died over 70. One sister at 40 of phthisis. Other two sisters over 60.	Has been Minister of Gospel. Had several attacks of fever, otherwise had good health. Total abstainer from liquors since early manhood.

GROUP IV.—(Continued.)

ONE BROTHER OR SISTER DEAD WITH CONSUMPTION.

No. of Case.	Present Age of Respondent.	Weight compared with Standard.	Brother or Sister died of Consumption.	Age at Death	History of rest of Family at Age 30.	Subsequent Developments in Family History.	Occupation, Habits, and Surroundings.
5	78	Average.	Sister.	20	Both parents and eight brothers and sisters living, all in good health.	Parents died 84, 88. One brother died at 70, another at 79, a sister at 72, the others in middle life.	Farmer all his life. Had typhus fever, otherwise good health. Good habits, moderate user of liquors always.
6	76	Average.	Sister.	18	Father and mother and a large family of bros. and sisters living. All good health. One G. parent 90 years; rest all died in middle life.	Both parents died of cancer at 75 and 80. A brother living at 66, rest of family all dead.	Has been a farmer always. Moderate user of liquors always. Has good health.
7	72	Below.	Sister.	37	Father, mother, six bros. and three sisters living, and in good health.	Father died of cancer, 85. Mother died 56, accident. Two brothers and three sisters living, a sister died at 21, of consumption, rest in middle life, various causes.	Has been a merchant. Was never very strong. A dyspeptic. A moderate user of alcohol.
8	80	Average.	Sister.	27	Father and mother living, also three bros. and four sisters.	Father died at 86, mother at 71. Two sisters died of consumption, aged 35, 42. None lived to be older than 66.	Has been a mason, used alcohol moderately in early life, none at all since 30. Generally good health.



ANNUAL REPORT
OF THE
MEDICAL DIRECTOR
OF THE
UNITED STATES LIFE INSURANCE CO.

For the Year Ending December 31st. 1877.

TO THE BOARD OF DIRECTORS OF THE UNITED STATES LIFE
INSURANCE COMPANY.

Gentlemen :

During the year which has just come to an end, there have been reported 105 losses by death, involving \$282,582. This shows an increase of \$20,772 over the amount reported last year. At the

same time the Company has carried a larger amount of insurance (on a greater number of lives) than during the previous year.

For purposes of comparison, I submit herewith a table showing the number and causes of deaths, and the average exposure, according to classes of disease, for the past eight years. From this tabular statement several interesting facts may be gleaned ; I shall call your attention, however, only to the following :

The average duration (exposure) of the policies which become claims through death is steadily increasing. During the four years from 1870 to 1873 inclusive, the average exposure was 7.11 years ; while during the last four, from 1874 to 1877 inclusive, it has been 10.13 years. The same is true of those policies which have become claims through death from consumption and chronic bronchitis ; the average duration (exposure) during the first four years (1870-1873) being 7.37 years, while during the last four (1874-1877) it was 9.15 years.

Respectfully submitted by

ALBERT H. BUCK, M. D.

NEW YORK, January, 1878.



	1870.		1871.		1872.		1873.		1874.		1875.		1876.		1877.	
	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.	Number of Cases.	Average Exposure.
ZYMOTIC DISEASES,																
Such as Yellow Fever, Malarial and Typhoid Fevers, Small-pox, Erysipelas, Carbuncle, Dysentery, Diphtheria, &c.....	5	4	3	9 ³ / ₄	13	5 ¹ / ₂	16	4 ¹ / ₂	12	7 ¹ / ₂	4	7 ¹ / ₄	11	9	13	10 ¹ / ₂
CONSTITUTIONAL DISEASES,																
Such as Gout, Rheumatism, Diabetes, Leucocythæmia, General Debility, Scrofula, Old Age, &c.....	1	4 ³ / ₄	1	3 ¹ / ₄	4	8	2	4	2	10 ¹ / ₄	3	20 ³ / ₄	4	13 ¹ / ₄	.....	.....
DISEASES OF THE BRAIN AND NERVOUS SYSTEM,																
Such as Softening, Insanity, Apoplexy, Inflammation or Congestion, Epilepsy, Nervous Prostration, Suicide, &c.....	11	5 ¹ / ₄	13	6 ³ / ₄	18	8 ¹ / ₂	16	6 ¹ / ₂	19	9 ¹ / ₄	7	10	17	13 ¹ / ₄	17	11 ¹ / ₂
(SUICIDES).....	(3)	(2 ¹ / ₄)	(3)	(4)	(2)	(8 ³ / ₄)	(3)	(5 ¹ / ₄)	(1)	(¹ / ₂)	.....	.....	(3)	(9 ¹ / ₄)	(1)	(12 ¹ / ₄)

DISEASES OF THE HEART AND BLOOD VESSELS.	3	9	5	7	6 ¹ ₂	4	8 ¹ ₄	12 ³ ₄	8 ³ ₄	7	11 ¹ ₄	21	14 ¹ ₄
DISEASES OF THE LUNGS.													
Consumption and Chronic Bronchitis.....	27	6 ¹ ₂	31	7	13	8	24	7 ¹ ₄	8 ¹ ₂	20	10 ³ ₄	23	10 ¹ ₄
Pneumonia, Pleurisy, Congestion of Lungs, &c.	10	6 ¹ ₄	10	7 ³ ₄	12	8	17	5 ³ ₄	9 ³ ₄	14	12 ¹ ₂	7	7 ¹ ₂
DISEASES OF THE ABDOMINAL ORGANS.													
Liver and Spleen.....	1	7	4	10	5	10 ¹ ₄	3	12 ¹ ₂	7 ¹ ₄	5	11 ¹ ₄	4	10
Kidneys.....	2	15 ¹ ₄	1	14 ¹ ₄	3	14 ³ ₄	3	9 ¹ ₂	13 ³ ₄	4	8 ³ ₄	7	8 ¹ ₂
Inflammation of Bowels, Diarrhoea, Peritonitis, Strangulated Hernia, &c.....	3	5 ³ ₄	6	8 ³ ₄	4	9 ³ ₄	2	4 ¹ ₄	12	6	8 ³ ₄	3	8 ¹ ₂
Gastritis and Ulcer of Stomach.....	..	..	4	11	3	6 ¹ ₂	2	6	8 ¹ ₂	4	10	..	9 ¹ ₂
Diseases of Bladder and Urethra.....	1	2	1	14 ¹ ₄	..	..	..	12	18	1	19	1	9 ¹ ₂
PUERPERAL FEVER and HEMORRHAGE.....	..	..	..	..	..	..	1	..	..	..	..	..	8
CANCER.....	2	7 ¹ ₂	2	10	..	..	2	9	17	4	11 ¹ ₂	2	..
ABSCESS.....	..	..	..	..	1	15 ¹ ₂	..	..	..	1	19 ¹ ₂	..	..
DISEASES OF INDETERMINATE SEAT.													
Such as "Dropsy," "Anasarca," "Ascites," &c.....	1	14	1	6 ¹ ₂	2	8 ³ ₄	3	2	..	2	24	1	13
INJURIES, BURNS, DROWNING.....	5	6 ¹ ₂	3	4 ¹ ₂	5	3	6	6 ³ ₄	4 ¹ ₂	6	9	5	8 ¹ ₂
INTEMPERANCE.....	..	..	..	..	2	5 ¹ ₄	4	..	0 ¹ ₄	..	..	1	3
Totals.....	72	6.47	85	7.67	92	7.75	105	8.42	96	106	11.41	105	10.75



ANNUAL REPORT
OF THE
MEDICAL DIRECTOR
OF THE
UNITED STATES LIFE INSURANCE CO.

For the year ending December 31st, 1878.

TO THE BOARD OF DIRECTORS OF THE UNITED STATES LIFE INSURANCE COMPANY.

Gentlemen :

The losses by death reported during the year which has just come to an end (1878) amount to \$231,990, or \$50,592 less than was reported for the year 1877, and \$44,010 less than the expected mortality.

In the Annual Report which I made to your body in January, 1877, I mentioned the fact that we were becoming more and more impressed with the necessity of testing the urine of applicants for life insurance. At that time, if I remember

rightly, we assumed that affections of the kidneys were so rare before the age of 45 or 50 that we could safely limit our practice of examining the urine to cases where the applicants had passed middle age ; accordingly, the urine was never tested in persons under 45 years of age, unless the appearance of the individual, or something in his past history, seemed to call for such an examination. The number of apparently healthy individuals whose urine contained a recognizable amount of albumen was found during 1877 to be so large that, on the 1st of January, 1878, Mr. Buell authorized us to establish the rule that an examination of the urine must be made *in every case*, at least in this and other large towns and cities. The practical results of this experiment, which has now been tried with great faithfulness for an entire year, are the following :

At the home office, in the City of New York, 211 individuals made application for policies on their lives. Their ages, divided into classes of five years, were :

AGES.	NO. OF INDIVIDUALS.
20—25	13
26—30	29
31—35	32
36—40	37
41—45	41
46—50	25
51—55	11
56—60	15
61—65	6
66—70	2
Total.....	<hr/> 211 <hr/>

Of these 211 individuals, 29 ($13\frac{1}{2}\%$) were found suffering from some disturbance of the genito-urinary system ; in 19 cases albumen was found (in only 2 of these cases with casts); in one case sugar alone was found ; in one case albumen and sugar were both found (death occurred within three or four months) ; finally, in 8 cases, evidences of inflammation of the bladder or urethra (stricture, in the majority) were found. These 29 individuals were all in fairly good health, and would, except, perhaps, in three or four cases, where the weight was excessive, have been accepted as insurable risks. Their ages, arranged in groups of five years, were as follows :

AGES.	NO. OF INDIVIDUALS.
20—25	2
26—30	3
31—35	4
36—40	4
41—45	5
46—50	2
51—55	1
56—60	3
61—65	4
66—70	1
Total.....	<u>29</u>

The individual in whose urine sugar alone was found was 66 years old ; the one in whose urine both albumen and sugar were found was 41 years old.

From this it will be seen that albuminuria occurs almost as frequently before the 46th year as after it; that is, nearly 8 per

cent. (11 out of 152) of all the individuals under 46 years of age were found to have albuminuria, while after that age the proportion was 13 per cent. (8 out of 59).

In the present state of medical knowledge, all these twenty* cases of albuminuria would be considered as manifesting at least the beginnings of disease of the kidneys, and could not, therefore, be recommended as fit subjects for life insurance. The full significance of the presence of albumen in the urine is, however, not yet understood. During the past two or three years doubts have been openly expressed in medical societies and the medical journals with regard to the value of albuminuria (*i. e.*, *un-complicated*) as an evidence of kidney disease. The question is one of very great importance, and it seems to us that it can be more fully investigated and answered by the medical officers of life insurance companies than by general practitioners of medicine or by experimental physiologists.

For this purpose careful records (name, address, date, age, occupation, &c.) should be kept of every apparently healthy (at least in all other respects) individual in whose urine albumen may be found, and then, from time to time, in subsequent years, the effort should be made to ascertain what has become of these individuals, whether alive or dead, in good or poor health, &c., &c. This is the course which the medical department of the company proposes to pursue, and we have reason to believe that the same plan will be carried out by more than one of the other companies.

* The albumen in the remaining eight cases of bladder or urethral disease may have come from the blood vessels of these parts, and not from the kidneys.

In conclusion I would state that all the examinations referred to above were made by my colleague, Dr. John Munn, who has exercised the greatest care to obtain absolutely accurate results, and who has, in the accompanying report, entered very fully into all the details.

Respectfully submitted by

ALBERT H. BUCK, M. D.,

Medical Director.

January. 1879.



ALBUMINURIA

IN

PERSONS APPARENTLY HEALTHY.

For several years past it has been the custom of many Life Insurance Companies to require an examination of urine, only in cases where the amount of insurance applied for was large, or where, from the personal history or physical appearance, a kidney difficulty was suspected. Upon examination of the mortality records we have found that nearly 10 per cent. of all the deaths of policy-holders in the United States Life Insurance Company, occurred from Bright's disease, so that it was considered judicious to require an examination of urine in as many cases as possible, with the view of ascertaining in what percentage of applicants the urine was abnormal. This work was undertaken in the latter part of 1877. So many cases of albuminuria were discovered among those presenting themselves for insurance as to warrant the belief that an examination of urine is necessary and should be required in the case of each applicant, and accordingly such an order was issued by the executive. This

furnished the opportunity to study the urine of persons apparently in perfect health, and it was determined to make careful records of each case, using the most delicate means possible to detect any variation from the normal condition.

For our purposes, it was necessary to be able to discover albuminuria in its incipency, and to do this special precautions were taken. It was found that after having boiled urine and added to it nitric acid, albumen, even when present in considerable quantity, might easily be overlooked if the test tube were not perfectly clean and bright, or if it were not held in light properly shaded. It is not sufficient to hold the tube before a dark background as is sometimes done, as the light from the window or burner dazzles the eye. It is necessary that the light enter the room through a comparatively small opening, and that it fall upon the test tube in such a manner as to allow the eye of the observer to rest upon a background entirely dark.

The importance of this arrangement for the detection of cloudiness in a fluid may be readily appreciated when we remember how completely filled with floating particles the atmosphere appears when sunlight enters a dark room through a small aperture, while in the same room with open windows the air seems perfectly clear.

After many experiments, the following method has been found to answer the purpose fully : I have placed immediately below the window glass, and extending up to it, a large square of black pasteboard. The dark window shade is drawn down to meet the upper margin of this pasteboard, and then carried out at the

bottom to a distance of about one foot. Immediately under this the test tube is held. In this manner none but reflected light meets the eye. If any one will place in a perfectly clean test tube urine containing a considerable quantity of albumen, boil the upper portion, incline the tube to an angle of 45 degrees, allow two or three drops of nitric acid to trickle down to the bottom, hold before an open window, or an unshaded burner, and afterwards place in light reflected as described above, he will lose his faith in tests for albumen as ordinarily undertaken.

The acid should be carefully added, drop by drop, while the tube is in the reflected light, as in this manner the test is far more delicate. It has also appeared that albumen in a urine, alkaline, neutral, or even faintly acid, will not be readily detected ;—the urine must be *distinctly* acid, and when it is not, should be rendered so by the addition of acetic acid, and thoroughly well shaken before boiling. Unless this precaution is taken, albumen will be overlooked in many cases.

It is also necessary that the urine be allowed to stand quietly in the test tube, at least five minutes after the nitric acid is added, at the expiration of which time, if no cloudiness appears, it may safely be pronounced non-albuminous.

The following table (see page 101) is made up of cases coming under my own observation. In each the heart and lungs were found to be normal; and nothing could be learned from the past history to lead to the suspicion that albuminuria existed ; furthermore, the physical appearance in every case (with perhaps

two exceptions) indicated a healthy condition. Each one considered himself in perfect health and really appeared as if he were. They were all excluded solely on account of albuminuria, and formed eleven per cent. of those presenting themselves to me for examination. In nearly every case two or more specimens taken at different times were examined and albumen found in each.

In a number of cases the applicant having been advised of the cause of rejection, returned to me saying that his family physician had examined a specimen of his urine and found it perfectly normal. I have been able, however, in a few such instances (indeed, whenever a personal interview has been had), to convince the physician that the examination as made by him would not have detected any but a considerable quantity of albumen, and great surprise was expressed on demonstrating the ease with which it is possible to overlook albumen, unless proper care is taken in the analysis. Such experiences have strengthened the conviction that tests as ordinarily made are far from being reliable. I make this assertion boldly.

While it is impossible to deduce definite conclusions from the limited number of cases here given, it is interesting to note that albuminuria was found as frequently in the young as in the old, half the number being under 45 years of age; that in nearly half the number there was excessive weight; that the pulse was rapid in nearly all, though very little importance may be attached to this; casts were found in but two cases.

No. of Case.	Occupation,	Age.	Weight.	Height.	Pulse.	Albumen.
1	Bank Clerk.....	23	125	5-8	76	Well marked.
2	Com. Merchant. . . .	23	180	5-6	86	Slight trace.
3	Lawyer.....	23	138	5-7	78	Abundant.
4	Public Officer.....	29	245	5-9	108	Abundant.
5	Com. Merchant	32	160	5-9	76	Considerable.
6	Iron Merchant.....	32	175	5-11	80	Mod. quantity.
7	Telegraphy.....	33	152	5-8	84	Well marked trace.
8	Physician.....	40	165	5-8	84	Mod. quantity.
9	Printer.....	40	176	5-6	82	Well marked.
10	Haydealer.....	41	185	5-11	74	Abundant.
*11	Bookkeeper in Brew- ery.....	41	210	5-10	85	Mod. quan. also sug'r
12	Mfr. Woolens	44	175	5-6	84	Abundant.
13	Liquors.....	45	140	5-5		Considerable.
14	None.....	47	167	5-5	92	Abundant.
15	Ins. Agent.....	50	181½	5-9½	92	Trace.
16	Safes.....	52	257	4-8½		Albumen.
17	None.....	53	140	5-9	88-90	Present.
18	Mech. Engineer....	54	180	5-10	108	Considerable.
19	Velvets.....	57	160	5-5	76	Considerable.
20	Lawyer.....	57	195	5-7	84	Well marked trace.
21	R. R. Pres't.....	61	186	5-9½	84	Mod. quantity.
22	Clothing.....	61	160	5-5	84	Mod. quantity.
23	Mer. Agent	61	161	5-9	78	Well marked trace.
24	Publisher....	61	165	5-8½	66	A trace.

* Applied for insurance and was accepted in Dec., 1877, no examination of urine. Applied again in three months, but was rejected, both sugar and albumen being found in urine. Died three months later.

There is great difference of opinion as to what the clinical significance of albuminuria really is, but that it should exist in eleven per cent. of a large number of individuals considering themselves perfectly healthy, and with no discoverable cause for its presence, is a fact worthy of consideration. As no discomfort is produced by it, our attention as physicians is not called to these cases, unless other manifestations of disease appear. Consequently such cases are very rarely observed. It is proposed to keep the cases here noted, together with such others as may come to my notice, under close observation ; to examine the urine from time to time, and note whatever changes occur in it, and in the general condition of the individual. By pursuing this plan for a number of years consecutively, we may hope to ascertain a little more definitely the real significance of albuminuria.

From the investigations thus far made, the following conclusions seem warranted :

1. Albuminuria does exist in a far greater proportion of individuals apparently in perfect health than is ordinarily supposed.
2. The method of testing as commonly practised fails to detect any but a considerable quantity of albumen ; it is absolutely necessary to use light properly shaded.
3. The urine, if not distinctly acid, must be rendered so before boiling.
4. In an alkaline urine, unless properly acidulated before boiling, at least five minutes must elapse after adding the nitric acid before it is safe to pronounce it non-albuminous.

5. The early morning specimen frequently contains no albumen, while that voided later in the day does ; consequently a morning specimen, which physicians usually require for analysis, is not to be depended on in testing for albumen.

6. Carelessness in procuring specimens (these often being received in an unclean vessel, or placed in a partially cleansed bottle), and the foul test tubes unfortunately used by many physicians, render the analysis untrustworthy.

The vessel receiving and conveying the urine, and the test tubes used in testing it, must be absolutely clean. The reagents used must be chemically pure.

NOTE.—An unclean urine receptacle favors the production of bacteria which appear in myriads after the vessel has stood a few hours in a warm temperature. The passing the fluid through many successive layers of filter paper will not remove these organisms sufficiently, and there is no means at present known by which they can be eliminated, except by filtering the urine through porous clay. As this is not practicable, fresh specimens only should be used in testing for albumen.

JOHN MUNN, M.D.



ALBUMINURIA

IN

PERSONS APPARENTLY HEALTHY.

(Second Paper.)

In the last annual report of this company, we stated under the above heading that ten per cent. of the deaths among policy-holders occurred from Bright's disease, and that in view of this fact an examination of the urine had been required in the case of each applicant during the preceding year ; that in the carrying out of this requirement, it was found that eleven per cent. of those presenting themselves for examination had albuminuria attended with no discomfort or unpleasant symptom, and with no discoverable cause for its existence. The most delicate tests known had been used in the examination, and the greatest possible care taken to discover any variation from the normal condition. An accurate record of the past family and personal history had been made in each case, and a full statement given of the habits, occupation, and present condition.

In the 24 cases reported at that time, we noted that albuminuria was found as frequently in the young as in the old ; that there was excessive weight in nearly half the number ; that the

pulse was rapid in nearly all ; and that casts were found in two cases. It was also stated that inasmuch as no discomfort is produced by albuminuria, our attention as physicians is not called to these cases until other manifestations of disease appear. Consequently, it is very rarely observed. In view of this fact, we proposed to keep the cases then examined, together with such others as came to our notice under close observation ; to examine the urine from time to time, and to note whatever changes occurred in it and in the general condition of the individual, and we expressed the hope that by pursuing this plan for a number of years consecutively, we might ascertain more definitely the real significance of the albuminuria.

It is proposed in this paper to give briefly the present condition of the individual and the urine in each of the 24 cases reported last year, and also to add to the number the new cases presented in the year just passed.

For the purpose of comparison, the table showing the condition one year ago has been reprinted on page 111, and on the adjoining page a second table, representing the present condition, is given.

Each case, with one exception, has been visited personally during the past month, and specimens of urine obtained from all but three.

No. of Case.	Occupation.	Age	Weight.	Height.	Pulse.	Albumen.
1	Bank Clerk.....	23	125	5-8	76	Well marked....
2	Com. Merchant.	23	180	5-6	86	Slight trace.....
†3	Lawyer.....	23	138	5-7	78	Abundant.....
4	Public Officer...	29	245	5-9	108	Abundant.....
5	Com. Merchant.	32	160	5-9	76	Considerable....
6	Iron Merchant..	32	175	5-11	80	Mod. quantity...
7	Telegraphy.....	33	152	5-8	84	Well m'k'd trace.
8	Physician.....	40	165	5-8	84	Mod. quantity...
9	Printer.....	40	176	5-6	82	Well marked....
10	Haydealer.....	41	185	5-11	74	Abundant.....
*11	Bookkeeper.....	41	210	5-10	85	Md. q'n also sugr
12	M'fr Woolens...	44	175	5-6	84	Abundant.....
13	Liquors.....	45	140	5-5		Considerable....
†14	None	47	167	5-5	92	Abundant.....
15	Ins. Agent.....	50	181½	5-9½	92	Trace.....
16	Safes	52	257	5-8½		Albumen
17	None	53	140	5-9	88-90	Present.....
18	Mec. Engineer..	54	180	5-10	108	Considerable....
19	Velvets	57	160	5-5	76	Considerable....
20	Lawyer.....	57	195	5-7	84	Well m'k'd trace.
21	R. R. Pres't	61	186	5-9½	84	Mod. quantity...
22	Clothing.....	61	160	5-5	84	Mod. quantity...
23	Mer Agent.....	61	161	5-9	78	Well m'k'd trace.
24	Publisher.....	61	115	5-8½	66	A trace.....

* Applied for insurance and was accepted in Dec., 1877, no examination of urine. Applied again in three months, but was rejected, both sugar and albumen being found in urine. Died three months later.

† Hyaline casts found.

No. of Case.	Occupation.	Age	Weight.	Height.	Pulse.	Albumen.	Casts.
1	Bank Clerk.....	24	128	5-8	80	Mod. quantity.	
‡2	Com. Merchant..	24	..	5-6		.....
3	Lawyer.....	24	156	5-7	100	Mod. quantity...	
4	Public Officer...	30	260	5-9	108	Mod. quantity ..	Hyaline.
5	Com. Merchant..	33	171	5-9	56	Loaded	
6	Iron Merchant..	33	190	5-11	80	Mod. quantity...	{ Epithelial and Hyaline.
7	Telegraphy.....	34	158	5-8	90	Will m'k'd trace.	
8	Physician.....	41	165	5-8	84	None.....	
9	Printer.....	41	180	5-6	104	Mod. quantity...	Hyaline.
10	Haydealer.....	42	197	5-11	67	Abundant.....	Small Hyaline.
*11	Bookkeeper.....	41	210	5-10	85	.....
12	M'fr. Woolens...	45	182	5-6	84	Trace.....	
13	Liquors.....	46	145	5-5	88	Mod. quantity...	{ Granular and Hyaline.
14	None.....	48	190	5-5	104	Abundant.....	{ Epithelial, Hy- aline and Gran- ular.
15	Ins. Agent.....	51	189	5-9½	84	None.....	
16	Safes.....	53	270	5-8½	100	Trace.....	{ Epithelial, Hy- aline and Gran- ular.
†17	None.....	54	..	5-9		.....
18	Mec. Engineer..	55	180	5-10	92	Loaded.....	
19	Velvets.....	58	170	5-5	80	Mod. quantity...	
20	Lawyer.....	58	210	5-7	90	Mod. quantity...	Hyaline.
‡21	R. R. Pres't....	62	..	5-9½	..	.....
22	Clothing.....	62	160	5-5	84	Mod. quantity...	
‡23	Mer. Agent.....	62	161	5-9	78	.....
24	Publisher.....	62	170	5-8½	68	Mod. quantity...	

* Deceased.

† In feeble condition, and out of town for his health.

‡ No specimen obtained.

An examination of the preceding table furnishes the following results :

One of the number has died.

The weight was found unchanged in three cases. It has increased in sixteen, and markedly increased in nine of this number.

The pulse was more rapid in ten cases, unchanged in five, and slower in four.

Albumen was present in less quantity in three, unchanged in six, and increased in eight. It was not found in two cases.

Casts were found in eight cases ; in seven for the first time by me ; hyaline alone in four cases, epithelial and hyaline in one, hyaline and granular in one, and epithelial, hyaline and granular in two cases. They were not discovered in one of the cases which presented them last year.

Each individual declared himself to be in good health, and said that his condition remained unchanged, though in after conversation it appeared that slight discomforts were manifested in some cases.

No change in appearance was noticeable, save in four cases. In these the puffy condition was more or less marked, though not distinctly so in any.

In six of the eight cases in which casts were found, there was marked increase in weight.

From the fact that albumen and casts may temporarily disappear from the urine and then reappear, we can neither say positively that casts have been developed during the past year,

nor that the albuminuria has permanently ceased in the two cases in which it is not found at the present time. We can only state the facts as they exist, and patiently await further developments in each of the cases under observation.

The following table represents the cases presented during the year ending February 1st, 1880. Each individual considered himself to be in perfect health, and there was nothing unusual in the appearance of any, save possibly three, to lead to any suspicion of the existence of albuminuria. There was nothing found to account for its presence, though the excessive use of tobacco was noted as a possible cause in one case. It was found in over twelve per cent. of those presenting themselves to me for examination.

No. of Case.	Occupation.	Age.	Weight.	Height	Pulse.	Albumen.
25	Actor.....	25	157	5- 6½	78	Well marked.
26	Clerk.....	27	155	5- 8¾	70	Mod. quantity.
27	Com. Traveler.....	28	153	5- 4	76	Loaded.
28	Broker.....	30	153	5- 7½	82	Loaded.
29	Broker.....	30	170	5-11	84	Faint trace.
30	Brick M'r.....	33	124	5- 8	72	Abundant.
31	Telegraphy.....	36	195	6	88	Trace.
32	Shirt M'r.....	39	149	4-11	84	Loaded.
33	Merchant.....	44	156	5- 9	76	Well marked.
34	Grocer.....	47	150	5- 6½	76	Trace.
35	Broker.....	48	175	5- 8	87	Trace.
36	None.....	49	200	5-11½	96	Mod. quantity.
37	Hardware.....	50	160	5- 6	96	Mod. quantity.
38	Broker.....	52	197	5-10½	76	Trace.
39	Hatter.....	53	195	5- 9	84	Well marked.
40	Broker.....	54	150	5- 6	80	Mod. quantity.
41	Dry Goods.....	55	180	5- 9	80	Trace.
42	Jeweler.....	56	220	5-11	75	Trace.
43	Banker.....	63	190	5- 9½	72	Trace.

In the preceding table, we find* as many cases among the young as among the old ; overweight in about half the number, but not quite so marked as in those reported last year ; an accelerated pulse in half the number, and casts in two of the nineteen cases.

Again we must admit that there is still great uncertainty in our knowledge of what the clinical significance of albuminuria really is. All authorities are pretty well agreed in this, that it is always pathological, never physiological, and that, if it remains unchecked, serious results will follow. Some observers assert this positively.

The percentage of cases may have been increased by reason of a previous knowledge of the existence of albuminuria, and by the consequent desire to obtain insurance. I think such instances very rare or entirely wanting; but as they may exist, we are not warranted in asserting that albuminaria exists in so large a percentage of individuals generally as we have found it among applicants for life insurance.

From the fact that casts have been found in eleven of the forty-three cases observed by me, I feel justified in regarding the condition a grave one, and worthy of the most careful consideration.

It is my purpose to continue the investigations until definite conclusions are reached, hoping to understand more fully not only what albuminuria really signifies, but also what conditions favor its development, its existence and its disappearance.

JOHN MUNN, M. D.

ALBUMINURIA

IN

PERSONS APPARENTLY HEALTHY.

(Third Paper.)

In last year's report on albuminuria, we referred to this subject in the following manner :

“ In the last annual report of this Company, we stated under the above heading that ten per cent. of the deaths among policy-holders occurred from Bright's disease, and that in view of this fact an examination of the urine had been required in the case of each applicant during the preceding year ; that in the carrying out of this requirement, it was found that eleven per cent. of those presenting themselves for examination had albuminuria attended with no discomfort or unpleasant symptom, and with no discoverable cause for its existence. The most delicate tests known had been used in the examination, and the greatest possible care taken to discover any variation from the normal condition. An accurate record of the past family and personal history had been made in each case, and a full statement given of the habits, occupation, and present condition.

“It was also stated that inasmuch as no discomfort is produced by albuminuria, our attention as physicians is not called to these cases until other manifestations of disease appear. Consequently, it is very rarely observed. In view of this fact, we proposed to keep the cases then examined, together with such others as came to our notice, under close observation ; to examine the urine from time to time, and to note whatever changes occurred in it and in the general condition of the individual, and we expressed the hope that by pursuing this plan for a number of years consecutively, we might ascertain more definitely the real significance of the albuminuria.”

* * * * *

It is proposed in this paper to give briefly the present condition of the individual, and the urine in each of the 43 cases reported last year, and also to add to the number the new cases presented in the year just passed.

Our tables are somewhat imperfect, as specimens of urine could not be obtained from 18 of the number.

CASES OBSERVED FIRST IN 1878.

No. of Case.	Occupation.	Age	Weight.	Height.	Pulse.	Albumen.	Casts.
1	Bank Clerk.....	23	125	5-8	76	Well marked...	Hyaline.
2	Com. Merchant.	23	180	5-6	86	Slight trace....	
3	Lawyer.....	23	138	5-7	78	Abundant.....	
4	Public Officer...	29	245	5-9	108	Abundant.	
5	Com. Merchant	32	160	5-9	76	Considerable....	
6	Iron Merchant..	32	175	5-11	80	Mod. quantity..	
7	Telegraphy.....	33	152	5-8	84	Well m'k'd trace.	
8	Physician	40	165	5-8	84	Mod. quantity..	
9	Printer.....	40	176	5-6	82	Well marked...	
10	Haydealer.....	41	185	5-11	74	Abundant.....	
* 11	Bookkeeper.....	41	210	5-10	85	Md. q'n also sugr	Hyaline.
12	M'fr Woolens...	44	175	5-6	84	Abundant.....	
13	Liquors.....	45	140	5-5	.....	Considerable....
14	None.....	47	167	5-5	92	Abundant.....	
15	Ins. Agent.....	50	181½	5-9½	92	Trace.....	
16	Safes.....	52	257	5-8½	.....	Albumen.
17	None.....	53	140	5-9	88-90	Present.....	
18	Mec. Engineer..	54	180	5-10	108	Considerable....	
19	Velvets.....	57	160	5-5	76	Considerable....	
20	Lawyer.....	57	195	5-7	84	Well m'k'd trace.	
21	R. R. Pres't....	61	186	5-9½	84	Mod. quantity..	
22	Clothing.....	61	160	5-5	84	Mod. quantity..	
23	Mer. Agent.....	61	161	5-9	78	Well m'k'd trace.	
24	Publisher.	61	165	5-8½	66	Trace.....	

* Applied for insurance and was accepted in Dec., 1877, no examination of urine. Applied again in three months, but was rejected, both sugar and albumen being found in urine. Died three months later.

CONDITION IN 1880.

No of Case.	Occupation.	Age	Weight.	Height.	Pulse.	Albumen.	Casts.
1	Bank Clerk.....	25	130	5-8	88	Trace.....	Granular.
†2	Com. Merchant.	25	.....	5-6	.....	.....
3	Lawyer..	25	151	5-7	90	Mod. quantity..	
†4	Public Officer...	31	.....	5-9	.....	.....
†5	Com. Merchant.	34	.....	5-9	.....	.....
6	Iron Merchant..	34	190	5-11	94	Abundant.....	Hyaline.
7	Telegraphy.. ...	35	157	5-8	96	None.....	
†8	Physician.....	42	.....	5-8	.....	.....
9	Printer.....	42	172	5-6	84	Well marked....	
10	Haydealer	43	208	5-11	60	Mod. quantity..	
*11	Bookkeeper.....	41	210	5-10	85	Md. q'n also sugr.	Hyaline.
12	M'r Woolens...	46	177	5-6	76	Trace.....	
†13	Liquors.....	47	.....	5-5	.....	.....
14	None.....	49	195	5-5	88	Loaded	
†15	Ins. Agent.....	52	.....	5-9½	.....	.....
16	Safes.....	54	250	5-8½	92	Loaded....	Hyaline.
†17	None.....	55	140	5-9	100	.....
*18	Mec. Engineer..	54	180	5-10	108	Considerable....	
19	Velvets	58	170	5-5	80	Mod. quantity..	
†20	Lawyer.....	59	.....	5-7	.....	.....
†21	R. R. Pres't....	63	5-9½	
22	Clothing.....	64	160	5-5	76	Mod. quantity..	
†23	Mer. Agent.....	63	.....	5-9	.....	.....
24	Publisher.....	63	165	5-8½	64	Trace.....	

† No specimen obtained.

* Died.

CASES OBSERVED FIRST IN 1879

No. of Case.	Occupation.	Age.	Weight.	Height.	Pulse.	Albumen.
25	Actor	25	157	5- 6½	78	Well marked.
26	Clerk	27	155	5- 8¾	70	Mod. quantity.
27	Com. Traveler.....	28	153	5- 4	76	Loaded.
28	Broker	30	153	5- 7½	82	Loaded.
29	Broker	30	170	5-11	84	Faint trace.
30	Brick M'r.....	33	124	5- 8	72	Abundant.
31	Telegraphy.....	36	195	6	88	Trace.
32	Shirt M'r.....	39	149	4-11	84	Loaded.
33	Merchant	44	156	5- 9	76	Well marked.
34	Grocer.....	47	150	5- 6½	76	Trace.
35	Broker... ..	48	175	5- 8	87	Trace.
36	None	49	200	5-11½	96	Mod. quantity.
37	Hardware.	50	160	5- 6	96	Mod. quantity.
38	Broker	52	197	5-10½	76	Trace.
39	Hatter	53	195	5- 9	84	Well marked.
40	Broker	54	150	5- 6	80	Mod. quantity.
41	Dry Goods	55	180	5- 9	80	Trace.
42	Jeweler	56	220	5-11	75	Trace.
43	Banker.. ..	63	190	5- 9½	72	Trace.

CONDITION IN 1880.

No. of Case.	Occupation.	Age.	Weight.	Height.	Pulse.	Albumen.	Casts.
†25	Actor.....	26	.....	5- 6½	.....	
26	Clerk.....	28	155	5- 8¾	80	Mod. quantity.	
†27	Com. Traveler..	29	.....	5- 4	.....	
28	Broker.....	31	166	5- 7½	86	Loaded.....	Hyaline.
29	Broker.....	31	176	5-11	90	Faint trace...	
†30	Brick M'fr.....	34	.....	5- 8	.....	
†31	Telegraphy.....	37	.....	6	.....	
32	Shirt M'fr.....	40	149	4-11	68	Loaded.....	Hyaline.
33	Merchant.....	45	155	5- 9	76	Well marked..	
34	Grocer.....	48	150	5- 6½	92	Trace.....	
†35	Broker.....	49	.....	5- 8	.....	
36	None.....	50	220	5-11½	96	None.....	
37	Hardware.....	51	177	5- 6	100	Abundant....	Hyaline.
†38	Broker.....	53	.....	5-10½	.....	
†39	Hatter.....	54	.....	5- 9	.....	
*40	Broker.....	54	150	5- 6	80	Mod. quantity.	
†41	Dry Goods.....	56	.....	5- 9	.....	
42	Jeweler.....	57	210	5-11	76	Trace.....	
43	Banker.....	64	190	5- 9½	68	Well marked..	Hyaline.

† No specimen obtained.

* Died.

An examination of the preceding tables furnishes the following results :

Three of the number have died.

The weight of the body was found unchanged in 7 cases. It was diminished in 2, and increased in 20 of the number.

The pulse was unchanged in 7, diminished in 6, and increased in 19 cases. The change in this respect, however, has been so slight that little importance can be attached to this data.

Albumen has disappeared in 3, diminished in 3, remained unchanged in 13, and increased in 11 cases.

Casts were found in 8 cases : Hyaline in 7, and granular in 1.

With two exceptions, each individual declared himself to be in good health, and said that his condition remained unchanged, though in after conversation it appeared that slight discomforts were manifested in some cases.

No change in appearance was noticeable save in 3 cases.

In those cases which presented casts, the weight remained unchanged in 2, and increased in 6, though not to any great extent.

From the fact that albumen and casts may temporarily disappear from the urine, and then reappear, we can neither say positively that casts have been developed during the past year, nor that the albuminuria has permanently ceased in the three cases in which it is not found at the present time. We can

simply state the facts as they exist, and patiently await further developments in each of the cases under observation.

The following table represents the cases presented during the year 1880. Each person declared himself to be in perfect health, and nothing was found to account for the albuminuria.

It was found in 10 per cent. of all the cases examined.

No. of Case.	Occupation	Age	Weight.	Height.	Pulse.	Albumen.	Casts.
44	Printer	22	143	5- 9½	72	Mod. quantity..	
45	Bank Clerk.....	23	143	5-10	72	Mod. quantity..	
46	Clerk	27	160	5- 9½	80	Trace.....	Granular. { Epithelial. Hyaline. Granular.
*47	Lumber Dealer.	29	153	5- 6½	124	Loaded.....	
48	Tailor	31	130	5- 8½	86	Loaded.....	
49	Ins. Broker.....	33	136½	5-10½	80	Mod. quantity..	
50	Advertising.....	33	160	5- 8	104	Trace.....	
51	Liquors.....	38	135	5- 9½	72	Mod. quantity..	
52	Produce.....	38	175	5- 6	96	Well marked....	
53	Rubber	38	170	5-10	100	Loaded.....	
54	Bookbinder.....	39	198½	5- 9	84	Mod. quantity..	
55	None.....	41	134	5- 6	84	Mod. quantity..	
56	Undertaker.....	43	194	5- 8	90	Trace	
57	Liquors, etc.....	44	168	5- 6½	76	Mod. quantity..	
58	Saloon & Groc'y.	47	153	5- 7	84	Loaded.....	
59	Broker.....	48	224	6-	92	Mod. quantity..	
60	Lawyer.....	49	240	6- ½	74	Well marked....	
61	R. R. Pres't	50	175	5-11	80	Well marked....	
62	Stocks.....	50	158	5-11	90	Well marked....	
63	Artist	55	190	5- 9½	76	Well marked,...	
64	Silks	55	181½	6- 1	80	Trace	
65	Lawyer.....	56	165	6-	86	Mod. quantity..	Hyaline. { Epithelial. Hyaline. Granular,
66	Dry Goods.....	58	190	5- 9	84	Mod. quantity..	
67	Broker..	60	180	5- 8	70	Mod. quantity..	
68	Priest.....	62	180	5- 9	68	Trace	
69	Capitalist.....	67	145	5- 8	72	Loaded.....	Hyaline. "

* Died within three months.

In the preceding table we find overweight in nearly half, and underweight in one-fourth the number. Casts were present in 5 of the 26 cases.

Even with the increased experience of the past year, we must admit, as we did in the last report, that there is still great uncertainty with regard to the clinical significance of albuminuria.

In view of the fact that 4 of the number have died, and that the general appearance of the majority of those who have been under observation for more than one year is gradually deteriorating, I am led to believe that albuminuria should be regarded as of grave significance. In some cases, however, it may be of slight importance, and further research may possibly enable us to discriminate between them. With this object in view I propose a continuation of this investigation during the ensuing year.

JOHN MUNN, M. D.,

Medical Examiner.

SPECIAL REPORT

ON THE

MORTALITY OF REJECTED RISKS.

From the first of January, 1871, to the first of January, 1878, this Company refused insurance on 2,200 individuals. During the summer of 1879 an investigation was begun for the purpose of ascertaining how many of these individuals were at that time still alive, and what was their condition of health. After considerable labor, involving a very extensive correspondence with physicians, postmasters, and others, on the part of the officers and clerks here at the home office, and a great deal of unremunerated work on the part of our agents and many of our medical examiners in different parts of the country, we ascertained that out of the 2,200 individuals rejected 172 had died, and 1,773 were still alive. Of the remaining 255 individuals we found it impossible to ascertain any information. In estimating, therefore, the mortality of our rejected risks we have been obliged to disregard wholly these 255 lives. If the unstable character of a large proportion

of the population be taken into consideration, and if it be remembered that at least half of our letters of inquiry were directed to individuals who had not the slightest interest in our researches, I think we may justly congratulate ourselves on having been able to learn the subsequent life history of so many ($88\frac{1}{2}$ per cent.) of our rejected risks.

On examination I find that these 1,945 rejections may be divided into two great classes : One containing 1,369 individuals who had been examined by physicians outside of the Home Office, and *recommended* for insurance ; and a second containing 576 individuals who had been examined (partly by the medical officers at the Home Office, and partly by the Company's Medical Examiners outside of the City of New York) and *not recommended* for insurance. For the sake of convenience I will designate the first class or division by the term, "Home Office Rejections," and the second by that of "Not Recommended Risks." The results of our investigations into the mortality and present physical condition of these two main divisions are set forth in the following tables, which have kindly been prepared for me by the Actuary of the Company.

TABLE I.

DIVISION I. <i>Home Office Rejections.</i>		DIVISION II. <i>Not Recommended Risks.</i>	
Lives	1,369	Lives	576
Years of exposure.....	6,758.5	Years of exposure.....	2,472
Average exposure.....	4 $\frac{9}{10}$ years	Average exposure.....	4 $\frac{8}{10}$ years
Number now living.....	1,261	Number now living....	512
Expected deaths.....	77.4	Expected deaths	27.9
Actual deaths.....	108	Actual deaths.....	64

Total lives exposed.....	1,945
Total years of exposure.....	9,230.5
Average exposure.....	4 $\frac{7}{10}$ years.
Number now living.....	1,773
Expected deaths.....	105.3
Actual deaths.....	172

Ratio of actual deaths to expected—Home Office.....	1.38
“ “ “ Not Recommended Risks	2.30
“ “ “ on both divisions combined.....	1.63

CONDITION OF HEALTH OF THOSE NOW LIVING.

Alive and well.....	1,229
Health somewhat impaired	170
In poor health	149
State of health unknown.....	225

Of the 172 deaths known to have occurred among these 1,945 risks, 75, or $43\frac{1}{2}$ per cent, were due to consumption. In 36 instances (*i. e.*, in nearly 21 per cent. of the entire number of deaths) we failed to ascertain the cause of death. Undoubtedly many of these deaths also were due to consumption. The statement may, therefore, be made that not far from half of the entire number of deaths experienced among our rejected risks were due to consumption. According to an investigation which I made in 1873, and which was based on 1,000 deaths, the mortality from consumption, experienced by this Company, represented 27 per cent. of the entire mortality from all causes. As will be observed, this already excessive preponderance of deaths from consumption is far exceeded by that experienced among the deaths belonging to the class of rejected risks.

With regard to the other causes of death, the following table may be consulted :

TABLE II.
Causes of Death Classified.

CLASS OF DISEASES.	NO. OF DEATHS.
Zymotic diseases.	7
Acute bronchial and pulmonary affections.	4
Casualties.	4
Consumption.	75
Brain diseases, apoplexy, etc.	19
Heart diseases.	9
Various other diseases (chiefly chronic), and intemperance	18
Unknown causes.	36

Or if we compare this table with that based upon 1,000 consecutive deaths experienced by the Company, we shall obtain the following percentages for each of the different classes of disease.

TABLE III.

CAUSES OF DEATH.	PERCENTAGE OF ENTIRE MORTALITY.	
	In 1,000 Deaths of Insured Individuals	In 172 Deaths of Rejected Risks.
Zymotic diseases.....	20 ⁰ / ₁₀₀	4 ⁰ / ₁₀₀
Acute pulmonary and bronchial affections.....	9 ⁰ / ₁₀₀	2 ¹ / ₄ ⁰ / ₁₀₀
Brain diseases (apopl., paral., &c.).....	14 ¹ / ₄ ⁰ / ₁₀₀	11 ⁰ / ₁₀₀
Heart diseases, aneurism, &c.....	5 ¹ / ₃ ⁰ / ₁₀₀	5 ¹ / ₂ ⁰ / ₁₀₀
Consumption.....	27 ⁰ / ₁₀₀	43 ¹ / ₂ ⁰ / ₁₀₀
Various other diseases, partly acute, partly chronic.	18 ⁰ / ₁₀₀	10 ¹ / ₂ ⁰ / ₁₀₀
Casualties, assassination, &c.....	5 ³ / ₄ ⁰ / ₁₀₀	2 ¹ / ₄ ⁰ / ₁₀₀
Unknown causes.....	1 ⁰ / ₁₀₀	20 ¹ / ₄ ⁰ / ₁₀₀

An examination of the causes of rejection in the class of risks we are now considering, shows that they are susceptible of being divided into six classes, as follows :

I.—Personal predisposition to consumption.

II.—Inherited predisposition to consumption.

III.—Functional and organic affections of the organs of circulation of the blood.

IV.—Habits (excessive eating, drinking, or tobacco smoking),

V.—Occupation (dangerous or unhealthy).

VI.—Miscellaneous reasons (frequent attacks of illness, predisposition to inflammatory rheumatism, existing fistula in ano, marked disproportion between height and weight, tumors of a suspicious nature, enlarged liver, albuminuria, amount of insurance on applicant's life excessive, etc.).

Class I.

Personal Predisposition to Consumption.

This class may be subdivided into the following five subordinate classes :

1. "Subject to cough."
2. "Subject to asthma."
3. "Previous attacks of bronchial or pulmonary disease."
4. "Spitting of blood" at some previous period.
5. "Lungs not sound," as ascertained by auscultation or percussion.

TABLE IV.
HOME OFFICE.

Subdivision.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
1. Subject to cough.....	10	9	.509	1
2. Subject to asthma.....	32	30	1.881	2
3. Previous pulmonary disease.....	31	28	1.638	3
4. Spitting of blood.....	83	73	4.407	10
5. Lungs not sound.....	57	48	2.622	9
Totals.....	213	188	11.1	25

NOT RECOMMENDED.

Subdivision.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
1. Subject to cough.....	3	1	.072	2
2. Subject to asthma.....	4	2	.105	2
3. Previous pulmonary disease.....	1	0	.016	1
4. Spitting of blood.....	23	21	.897	2
5. Lungs not sound.....	185	153	7.300	32
Totals.....	216	177	8.4	39

CONTINUATION OF TABLE IV.

HOME OFFICE.		NOT RECOMMENDED.	
Lives exposed.....	213	Lives exposed.....	216
Years of exposure.....	1002.5	Years of exposure.....	824 5
Average exposure.....	4 $\frac{7}{10}$ yrs.	Average exposure.....	3 $\frac{8}{10}$ yrs.
Number now living.....	188	Number now living.....	177
Expected deaths	11.057	Expected deaths.	8.390
Actual deaths.....	25	Actual deaths.....	39

Total lives exposed	429
Total years of exposure	1,827
Average exposure	4 $\frac{3}{10}$ years.
Number now living.....	365
Expected deaths.....	19.447
Actual deaths.....	.64
Ratio of actual deaths to expected, H. O.....	2.25
“ “ “ N. R.....	4.62
“ “ “ on the whole class	3.27

PRESENT STATE OF HEALTH OF THOSE LIVING.	SUBDIVISION.					Totals.
	1.	2.	3.	4.	5.	
In good health	7	17	15	70	115	224
Health somewhat impaired.....	.....	8	6	9	26	49
In poor health.....	2	5	2	9	14	32
State of health not ascertained.....	2	2	5	5	46	60

The causes of death in the 64 deaths belonging to this class may be divided as follows :

Consumption.....	41
(64.6 per cent. of the total mortality of this class.)	
Pneumonia	2
Heart disease, apoplexy, liver complaint, accidental injuries, each one.....	4
Causes not ascertained	17
Total.....	<u>64</u>

Sudivision 4 is made up of risks rejected on account of spitting blood. The ratio of Actual to Expected mortality in this subdivision is.... 2.26
Ratio of Actual to Expected, as shown in an investigation made among accepted risks in 1872.... 1.79

Class II.

Inherited predisposition to Consumption.

This class may be subdivided into ten subdivisions, in accordance with the degree of taint found in the family history. These subdivisions are the following :

1. Both parents consumptive.
2. Mother and two or more brothers or sisters consumptive.
3. Father and two or more brothers or sisters consumptive.
4. Mother and one brother or sister consumptive.
5. Father and one brother or sister consumptive.
6. Mother consumptive.
7. Father consumptive.
8. Two or more brothers or sisters consumptive.
9. One brother or sister consumptive.
10. Family history doubtful.

TABLE V.

Subdivision.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
1	21	20	.974	1
2	16	16	.842	0
3	7	6	.235	1
4	28	27	1.490	1
5	21	21	1.213	0
6	127	121	6.070	6
7	78	76	3.284	2
8	47	43	2.549	4
9	36	34	1.844	2
10	89	87	4.385	2
Totals.....	470	451	22.89	19

Total lives exposed.....	470
Total years of exposure.....	2,324
Average exposure.....	5 years.
Number now living.....	451
Expected deaths.....	22 89
Actual deaths.....	19
Ratio of actual deaths to expected.....	.83
Ratio of actual to expected deaths, as shown in investigation made among accepted risks in 1872.	82

PRESENT STATE OF HEALTH OF THOSE LIVING.

Subdivision.	1	2	3	4	5	6	7	8	9	10	Totals.
In good health.....	14	11	6	17	16	89	59	38	27	72	349
Health somewhat impaired	3	2	....	3	3	13	8	1	3	3	39
In poor health.....	1	1	....	5	1	5	2	2	2	7	26
State of health not ascertained.....	2	2	....	2	1	14	7	2	2	5	37

The causes of death in these 19 deaths are the following :

Consumption..... 12

(63.16 per cent. of total mortality of this class.)

Diphtheria, cerebro-spinal meningitis, dropsy and

paralysis, each one..... 4

Accidental injuries..... 2

Causes not ascertained..... 1

Total..... 19

In order to compare the results in this class with the results of the investigation of accepted risks made in 1872, we must make a new arrangement of subdivisions, as follows :

1. Both parents consumptive.
2. Father consumptive.
3. Mother consumptive.
4. Father and one or more brothers or sisters consumptive.
5. Mother and one or more brothers or sisters consumptive.
6. One or more brothers or sisters consumptive.

TABLE VI.

Subdivision	REJECTED RISKS.				Ratio of Actual Deaths to Expected.	
	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.	Among re-jected risks.	Among ac-cepted risks*
1	21	20	.974	1	1.03	1.33
2	78	76	3.284	2	.61	.47
3	127	121	6.070	6	.99	.73
4	28	27	1.448	1	.70	1.34
5	44	43	2.332	1	.43	1.78
6	83	77	4.393	6	1.37	.5

* Inquiry of 1872.

Class III

Functional and organic affections of the organs of circulation of the blood.

This class is susceptible of being divided into two groups, one composed of individuals affected with organic disease of the heart (enlargement, valvular defects, or suspected fatty degeneration), and a second composed of those in whom the heart derangement seemed to be purely functional (attacks of palpitation, and rapid, intermittent, or unsteady action of the organ).

TABLE VII.

SUBDIVISION 1.—(Organic Affections.)

Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
112.	100	6.374	12.

SUBDIVISION 2.

(Functional Derangements).

HOME OFFICE.				NOT RECOMMENDED.			
Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
46	45	2.692	1	55	54	2.980	1

Total lives exposed.....	213
Total years of exposure.....	996.5
Average exposure.....	4 $\frac{9}{10}$ years.
Number now living.....	199
Expected deaths.....	12.046
Actual deaths.	14
Ratio of actual deaths to expected—Subdivision 1	1.88
“ “ “ Subdivision 2. { H. O..	.37
“ “ “ “ { N. R..	.33
Ratio of actual deaths to expected on the whole of Sub- division 2.....	.35
Ratio of actual deaths to expected on both Subdivisions ..	1.16

PRESENT STATE OF HEALTH OF THOSE LIVING.

SUBDIVISION.	1	2	TOTALS.
In good health.....	68	69	137
Health somewhat impaired.....	6	11	17
In poor health.....	7	9	16
State of health not ascertained.....	19	10	29

The causes of the 14 deaths that occurred in this class are as follows :

Heart disease... ..	4 (two in each subdivision).
Paralysis.....	1
Disease of bowels.....	1
Consumption.....	2
Dropsy.....	1
Unknown causes	5
Total	<u>14</u>

Class IV.

HABITS.

(Excessive Eating, Drinking or Tobacco Smoking.)

TABLE VIII.

HOME OFFICE				NOT RECOMMENDED.			
Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
118	102	7.197	16	30	26	1.790	4
Lives exposed. 118				Lives exposed. 30			
Years of exposure. 584.5				Years of exposure. 144			
Average exposure. 5 $\frac{1}{10}$ years.				Average exposure. 4 $\frac{8}{10}$ years.			
Number now living. 102				Number now living. 26			
Expected deaths. 7.197				Expected deaths. 1 790			
Actual deaths. 16				Actual deaths. 4			
Total lives exposed. 148							
Total years of exposure. 728.5							
Average exposure. 5 years.							
Number now living. 128							
Expected deaths. 8.987							
Actual deaths. 20							
Ratio of actual deaths to expected—H. O. 2.22							
“ “ “ N. R. 2.23							
“ “ “ on the whole class. 2.23							

PRESENT STATE OF HEALTH OF THOSE LIVING.

In good health.....	78
Health somewhat impaired.....	8
In poor health.....	22
State of health not ascertained.....	20

Of the 20 deaths that occurred in this class, the causes are as follows :

Intemperance.....	3
Consumption.....	2
Apoplexy.....	1
Suicide.....	1
Congestion of lungs.....	1
Pneumonia.....	1
Dropsy of chest.....	1
Accidental injuries.....	1
Unknown causes.....	9
Total.....	20

Class V.

OCCUPATION.

TABLE IX.

Total lives exposed.....	80
Total years of exposure.....	374.5
Average exposure.....	4 $\frac{7}{10}$ years.
Number now living.....	76
Expected deaths.....	3.930
Actual deaths.....	4
Ratio of actual deaths to expected.....	1.06

PRESENT STATE OF HEALTH OF THOSE LIVING.

In good health.....	59
Health somewhat impaired.....	4
In poor health.....	4
State of health not ascertained.....	9

In this class there were four deaths, one from Bright's disease, one from "fever," one from diphtheria, and one from some cause not ascertained.

Class VI.

Miscellaneous Causes of Rejection.

TABLE X.

HOME OFFICE.				NOT RECOMMENDED.			
Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.	Lives Exposed.	Now Living.	Expected Deaths.	Actual Deaths.
478	436	31.058	42	127	118	6.729	9
Lives exposed.....				Lives exposed.....			
478				127			
Years of exposure.....				Years of exposure.....			
2397.5				572.5			
Average exposure.....				Average exposure.....			
5 yrs.				41 ⁵ / ₁₀ yrs.			
Number now living.....				Number now living.....			
436				118			
Expected deaths.....				Expected deaths.....			
31.1				6.7			
Actual deaths.....				Actual deaths.....			
42				9			

Total lives exposed.....	605
Total years of exposure.....	2,970
Average exposure.....	4 ⁹ ₁₀ years.
Number now living.....	554
Expected deaths.....	37.787
Actual deaths	51
Ratio of actual deaths to expected, H. O.....	1.36
“ “ “ N. R.....	1.35
“ “ “ on the whole class....	1.35

PRESENT STATE OF HEALTH OF THOSE LIVING.

In good health.....	381
Health somewhat impaired.....	53
In poor health.....	49
State of health not ascertained.....	71

The 51 deaths occurring in this class were due to the following causes :

Consumption.....	18
Apoplexy, brain disease, &c	9
Heart disease.....	4
“ Dropsy ”.....	2
“ Fever ”.....	2
Miscellaneous causes.....	7
Not ascertained.....	9
Total.....	51

The results of the preceding investigation may be briefly summarized as follows :

In the first place, these rejected lives, taken as a whole, have turned out, after an exposure of less than five years, to be decidedly poor risks ; the mortality among them being 63 per cent. higher than that which the tables call for. But the poor quality of these risks is shown not merely by the excessive mortality thus far experienced, but also by the promise of a continued excessive death-rate in the future, as shown by the large number of individuals either in poor health (149), or in health which may be designated as "somewhat impaired" (170).

In the next place, if we compare the six different groups into which these rejected risks have been divided, we shall find that the heaviest mortality has been experienced among those who were believed to possess a personal or acquired predisposition to consumption ; the mortality in this class being $3\frac{2}{10}$ times as great as that called for by the tables.

The next largest mortality has been experienced among those individuals who were believed to be intemperate in their habits ; the rate being $2\frac{2}{10}$ times greater than that of the tables.

With regard to the remaining classes there are but two or three points to which I desire to call attention. In Class III., the heavy mortality experienced among those who were believed to be suffering from some organic affection of the heart, contrasts strongly with the unusually small mortality experienced among those who manifested evidences of merely a functional

disturbance of this organ. The contrast is almost as marked between Classes I. and II. (Personal and inherited predisposition to consumption). Were it not for the small number of individuals comprised in Classes II. and III., I should feel as if we might safely attach less importance than we do to the value of "functional disturbances of the heart" and "family history," in estimating the probable longevity of any individual risk. It is interesting to note in this connection that an inquiry made in 1872 (see annual report of 1873), for the purpose of determining the mortality experienced by the company among policy-holders who were believed to possess an inherited predisposition to consumption, also revealed a death-rate lower than that called for by the tables, viz., about $\frac{82}{100}$ of the same.

Respectfully submitted by

ALBERT H. BUCK, M. D.



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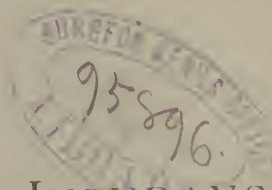
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